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ORIGINAL ARTICLES.

A REVIEW OF SOME OF THE MORE IMPORTANT PECULIARITIES OF THE SPIRILLUM ("COMMA-BACILLUS") OF ASIATIC CHOLERA.

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At the conference held in Berlin in 1884, for the purpose of discussing the cholera-question, it was announced by Koch¹ that he had discovered in the intestinal evacuations of individuals suffering from cholera, a microorganism that he believed to be the cause of the malady. The morphologic, cultural, and chemic characteristics of this organism are as follows: In morphology it is from 0.8μ to 2μ long, and from one-sixth to one-third of its length in diameter, that is to say, it is about from one-half to two-thirds of the length of the tubercle-bacillus, but it is thicker, plumper, and slightly curved. Usually this curve is not more marked than that of a comma, though at times it is much more pronounced and may even describe a semicircle. Again, the curve may be double, one comma joining another, with the convexity of their curves pointing in opposite directions, so that an S is produced; most probably, however, this form does not represent a single individual organism, but two that have adhered together, end to end, after division has been completed. In cultures the organism frequently forms long threads. These are not straight, nor are they simply undulating threads, but long, delicate spirals, which in their length and in other respects resemble strongly the spirochæta of relapsing fever. From these appearances this organism cannot be considered to be a true bacillus, but occupies, rather, an intermediate place between the bacilli and the spirilla. It may be that the short comma-forms represent segments of a true spirillum, the normal form of the organism.

They do not form spores, and no reliable evidence has been advanced in support of the opinion that they possess the power of entering into a stage in which their resistance to detrimental agencies is increased.

They are actively motile, especially when in the comma-stage, though the long threads also possess the power of independent motion. When stained by the special method of Loeffler² for the demonstra-

tion of flagella, they are found to be provided with these organs of locomotion. According to Loeffler, this organism forms one of that group of motile bacteria that are provided with but a single flagellum attached to one of its extremities.

They grow luxuriantly in bouillon, causing a diffuse clouding and the ultimate production of a delicate film upon the surface. On solidified blood-serum their growth is accompanied by slow liquefaction. They develop actively in milk, but do not cause the milk to curdle, nor do they separate the casein as do many other bacteria. The milk appears to remain unchanged. In sterilized milk containing blue-litmus tincture the color is changed to pink in from twenty-four to forty-eight hours at 37° C. On nutrient gelatin the colonies of this organism appear, when quite young, as pale, transparent drops, not perfectly round. They are dentated at the edges and granular in appearance; as the colony increases in size, this granulation becomes more marked, until the colony appears to be made up of a mass of highly refractive points. In this stage it has the appearance of finely broken glass. It causes a liquefaction of the gelatin round about it, and ultimately a funnel-shaped depression results, into the most dependent part of which the colony proper sinks.

The liquefaction of gelatin by the colonies of this organism, when growing on plates, rarely or never extends more than one millimeter beyond the growing colony. It never causes the widespread liquefaction that accompanies the growth of many other organisms, and particularly is this difference seen in two sets of plates made for the comparison of this organism with the somewhat similar organism described by Finkler and Prior.³ The colonies of this organism on gelatin plates, when of recent growth and very closely packed together, give to the surface of the gelatin, when viewed by reflected light, an appearance very similar to that of a ground-glass surface.

In stab-cultures in gelatin there appears at the top of the needle-track, after from twenty-four to forty-eight hours, at the ordinary temperature of the room, a small funnel-shaped depression. As the growth progresses, liquefaction will be seen to occur at this point. In the center of this depression can readily be distinguished a small, dense, white clump, the colony itself. As growth continues, this depression increases in extent, and ultimately assumes

an appearance that can truly be said to be characteristic of the growth of this organism, for in this respect it is simulated by the growth of no other organism with which we are acquainted. This appearance consists in the apparent sinking of the bottom of the funnel-shaped depression at the top of the needle-track in such a way as to leave a perceptible air-space between the top of the liquid portion and the surface of the gelatin, so that the growth assumes the appearance of being capped at its highest point by a minute air-bubble. It gives the impression not only of the liquefaction of the gelatin having taken place, but also of a coincident evaporation of the fluid from the liquefied area, and a constriction of the superficial opening of the funnel. In stab-cultures in gelatin the liquefaction is much more extensive than that usually seen around colonies on plates. It spreads laterally from the needle-track, and in about a week a large part of the gelatin in the tube may become fluid, and the growth lose its characteristic appearance.

The organism grows well without liquefaction on nutrient agar-agar. The growth, however, is not characteristic, forming simply a grayish-white, moist layer. It grows on potato as a light grayish-brown layer. This occurs, however, only at the temperature of the incubator—37° to 38° C.—owing probably to the acidity of the potato, which is sufficient to prevent its development at the low temperature, but is not sufficient to have this effect where the temperature is more favorable to growth. The temperature which is most favorable for its growth is between 35° and 38° C. It grows well, but more slowly, at 17° C. Under 16° C. no growth is visible.

Koch's experiments led him to conclude that the vitality of the organism is not destroyed by freezing. It is strictly aerobic, its development ceasing if the supply of oxygen is cut off. It does not grow in an atmosphere of carbonic acid. It is, however, not killed by a temporary exposure to carbonic acid, or by absence of oxygen for a limited time, for it readily grows again when placed under favorable conditions. It does not grow in acid media, but does best under neutral or faintly alkaline reaction. Kitasato⁴ found that an acid reaction equivalent to from 0.066 to 0.08 per cent. of hydrochloric or nitric acid, at a temperature of from 20° to 22° C., was sufficient to check development.

When grown in Dunham's peptone solution⁵ the organism produces indol and, coincidentally, nitrites; so that, by the addition of concentrated sulphuric acid, the rose-color characteristic of the indol reaction is most conspicuously produced. This reaction is to be obtained not only in artificial cultures of the organism, but also in the "rice-water" discharges of patients suffering from Asiatic cholera.

In cultures, the development of this organism reaches its maximum relatively quickly, then remains stationary for a short period, after which degeneration begins. The dying comma-bacilli become altered in appearance and assume the condition known as involution-forms. When in this state they take up coloring reagents very faintly or not at all, and may lose entirely their characteristic shape.

When present with other bacteria, under conditions favorable to growth, the comma-bacilli at first grow much more rapidly than do the others; in twenty-four hours they will often so outnumber the other organisms present that microscopic examination would lead one to think that the material under examination was a pure culture of this organism. This, however, does not last longer than two or three days; they then begin to die, and the other organisms gain the ascendancy. It is not improbable that a similar process occurs in the intestines of those suffering from Asiatic cholera: a rapid multiplication of the comma-bacilli that have gained access to the intestines takes place, which lasts for but a short time, when the comma-bacilli begin to disappear, and after a few days their place is taken by other organisms.

In connection with his experiments upon the poison produced by the cholera-organism, Pfeiffer⁶ states that in very young cultures, grown under the access of oxygen, there is present a poisonous body that possesses extraordinarily intense toxic properties. This primary cholera-poison stands in very close relation to the material composing the bodies of the bacteria themselves, and is probably an integral constituent of them. The vitality of the cholera-spirilla can be destroyed by means of chloroform and thymol, and by drying, without apparently any alteration of this poisonous body. Absolute alcohol, concentrated solutions of neutral salts, and a temperature of 100° C. decompose this substance, leaving behind secondary poisons which possess a similar physiologic activity, but only when given in from ten to twenty times the dose necessary to produce the same effects with the primary poison.

Other members of the vibrio family, also, namely, the vibrio Metschnikovi and that of Finkler and Prior, contain closely related poisons.

Experiments upon Animals.—As a result of experiments for the purpose of determining if the disease can be produced in any of the lower animals, it is found that white mice, monkeys, cats, dogs, poultry, and many other animals are not susceptible to the disease by the methods usually employed in inoculation-experiments. When animals are fed on pure cultures of the comma-bacillus no effect is produced, and the organisms cannot be obtained from the stomach or intestines; they are destroyed in the stomach and do not reach the intestines; they are not

demonstrable in the feces of these animals. Intravascular injections of pure cultures into rabbits are followed by a temporary illness, from which the animals usually recover in from two to three days; intraperitoneal injections into white mice are, as a rule, followed by death in from twenty-four to forty-eight hours; the conditions in both instances most probably resulting from the toxic activities of the poisonous products of growth of the organism that are present in the culture employed. None of the lower animals have ever been known to suffer from cholera spontaneously.

The experiments of Nicati and Rietsch,⁷ in which the common bile-duct was ligated, and fluid cultures of the organism were injected directly through the walls of the duodenum, demonstrated the fact that the acid reaction of the gastric juice destroyed the cholera-organisms and prevented their access to the small intestine when they had been administered by the mouth; at the same time it was seen that the interference with the flow of bile diminished intestinal peristalsis, and permitted the organisms to remain for a longer time where they had been deposited. By this method Nicati and Rietsch,⁷ van Ermengen,⁸ Koch,¹ and others were enabled to produce in the animals upon which they operated a condition that was, if not identical, at all events very similar pathologically to that seen in the intestine in subjects dead of the disease.

At a subsequent conference held in Berlin in 1885, Koch¹ described another method by means of which he had been able to obtain a relatively high degree of constancy in all his efforts to produce cholera in lower animals. The method which he employed is as follows: Bearing in mind the point made by Nicati and Rietsch in regard to the reaction of the gastric juice, this reaction was first to be neutralized, by the injection, through a soft catheter passed down the esophagus into the stomach, of 5 c.c. of a 5 per cent. solution of sodium carbonate. Ten or fifteen minutes later this was to be followed by the injection into the stomach (also through a soft catheter) of 10 c.c. of a bouillon-culture of cholera-spirilla. For the purpose of arresting peristalsis and permitting the organisms to remain in the stomach and upper part of the duodenum for as long a time as possible, the animal was to receive, immediately following the injection of the culture, an intra-peritoneal injection, by means of a hypodermatic syringe, of 1 c.c. of tincture of opium for each 200 grams, by weight, of the animal. Shortly after this last injection a deep narcosis sets in and lasts from a half to one hour, after which the animal is again as lively as ever. Of 35 guinea-pigs inoculated in this way by Koch, 30 died of a condition that was, in general, very similar to that seen in Asiatic cholera.

The condition of these animals before death is described as follows: Twenty-four hours after the operation the animal appears sick; there is a loss of appetite, and the animal remains quiet in its cage. On the following day a paralytic condition of the hind extremities appears, which, as the day goes on, becomes more pronounced; the animal lies quite flat upon its abdomen or on its side, with its legs extended; respiration is weak and prolonged, and the pulsations of the heart are hardly perceptible; the head and extremities are cold, and the body temperature is frequently subnormal. The animal usually dies after remaining in this condition for a few hours.

At autopsy the small intestine is found to be deeply injected and filled with a flocculent, colorless fluid. The stomach and intestines do not contain solid masses, but fluid; when diarrhea does not occur, firm scybalæ may be expected in the rectum. Both by microscopic examination and by culture-methods, comma-bacilli are found to be present in the small intestine in pure culture.

From what has already been said, it will be seen that for the diagnosis of Asiatic cholera by bacteriologic methods, it is essential that the evacuations be examined as soon as possible after they have been passed. If the case happens to be a fatal one, running a rapid course, it is not impossible to make a diagnosis upon microscopic examination alone, for under these conditions it is common to find the organisms present in such enormous numbers as to be practically in pure culture.

Weisser and Franck⁹ are so firmly convinced of the possibility of an accurate diagnosis being made by microscopic examination alone, in positive cases, that they express themselves in the following terms:

1. In the majority of cases microscopic examination is sufficient for the detection of the presence of the comma-bacillus in the intestinal evacuations of cholera-patients.

2. Even in the most acute cases, running a very rapid course, the comma-bacillus can always be found in the evacuations.

3. In general, the number of cholera-spirilla present is greater the earlier the death occurs; when death is postponed, and the disease continues for a longer period, their number is diminished.

4. Should the patient not die of cholera, but from some other disease, such as typhoid fever, that may be engrafted upon it, the comma-bacilli may disappear entirely from the intestines.

In dejections that are not examined immediately after being passed it is often difficult, because of the large number of other bacteria that may be present, to detect the cholera-organism by microscopic examination. According to Schottelius,¹⁰ it is advan-

tageous in these cases to mix the dejections with about double their volume of slightly alkaline meat-infusion, and to allow them to stand exposed to the air for about twelve hours at a temperature of between 30° and 40° C. There appears at the end of this time, *especially upon the surface of the fluid*, a conspicuous increase in the number of comma-bacilli, and cover-slip preparations, made from the upper layers of the fluid, will reveal an almost pure culture of this organism.

In Asiatic cholera the organisms can also be detected in the vomited matters, though not so regularly as in the intestinal evacuations.

As a rule, bacteriologic examination fails to reveal the presence of the organisms in the blood and internal organs in this disease, though Nicati and Rietsch claim to have obtained them from the common bile-duct in rapidly fatal cases, and in two out of five cases they were present in the gall-bladder. Doyen and Rasstschewsky¹¹ found them in the liver in pure cultures, and Tizzoni and Cattani¹² in both the blood and gall-bladder.

The cholera-spirillum is a facultative parasite; that is to say, it apparently finds in certain portions of the world, particularly in those countries in which Asiatic cholera is endemic, conditions that are not entirely unfavorable to its development outside of the body. This has been found to be the fact not only by Koch,¹ who detected the presence of the organism in the water-tanks in India, but by many other observers, who have succeeded in demonstrating its growth under conditions not embraced in the ordinary methods that are employed for the cultivation of bacteria.

The results of experiments having for their object the determination of the length of time during which this organism may retain its vitality in water are conspicuous for their irregularity. In the transactions of the congress, in Berlin, for the discussion of the cholera-question, it was stated in regard to this point, that the experiments made with tank-water in India sometimes resulted in the demonstration of the multiplication of the organisms introduced into it, while in other cases these died very quickly.

On February 8, 1884, comma-bacilli were found in the tank at Saheb-Began, in Calcutta, and it was possible to demonstrate them in a living condition up to February 23d.

Koch states that in ordinary spring-water or well-water the organisms retain their vitality for thirty days, whereas in the canal-water (sewage) of Berlin they died after six or seven days; but if this latter be mixed with fecal matters, the organisms retain their vitality for but twenty-seven hours; and in the undiluted contents of cesspools, it is impossible to demonstrate them after twelve hours. In the experiments of Nicati and Rietsch they retained their

vitality in sterilized distilled water for twenty days; in Marseilles canal-water (sewage), for thirty-eight days; in sea-water, sixty-four days; in harbor-water, eighty-one days, and in bilge-water, thirty-two days.

In the experiments of Hochstetter, on the other hand, the cholera-spirilla in distilled water died in less than twenty-four hours in five of seven experiments; in one of the two remaining experiments they were alive after a day, and in the other after seven days.

In one experiment with the domestic water-supply of Berlin the organism retained its vitality for 267 days; in another for 382 days, notwithstanding the fact that many other organisms were present at the same time. There is no single ground upon which these variations can be explained, for they depend apparently upon a number of factors, which may act singly or together. For example, in general it may be said that the higher the temperature of the water in which these organisms are present, up to 20° C., the longer do they retain their vitality; the purer the water, that is, the poorer in organic matters, the more quickly do the organisms die, whereas the richer it is in organic matter the longer do they retain their vitality.

Still another point that must be considered in this connection is the antagonistic influences under which these organisms find themselves when placed in water containing organisms that are, so to speak, at home in water—the so-called normal water-bacteria.

In his experiments upon the behavior of micro-organisms in the soil, Carl Fraenkel¹³ found that the cholera-spirillum was not markedly susceptible to those deleterious influences that cause the death of a number of other pathogenic organisms. During the months of August, September, and October, cultures of the Asiatic-cholera organism that had been buried in the ground at a depth of three meters retained their vitality. On the other hand, in other months, particularly from April to July, they lost their vitality when buried to the depth of only two meters. At a depth of one and a half meters vitality was not destroyed, and there was a regular development in cultures so placed.

As a result of experiments performed in the Imperial Health Bureau, at Berlin, it was found that the bodies of guinea-pigs that had died of cholera induced by Koch's method of inoculation, contained no living cholera-spirilla when exhumed after having been buried for nineteen days in wooden boxes, or for twelve days in zinc boxes. In a few that had been buried in moist earth, without having been encased in boxes, when exhumed after two or three months, the results of examinations for cholera-spirilla were likewise negative.

Kitasato,¹⁴ in his experiments with the cholera-

organism, found that when mixed with the intestinal evacuations of human beings under ordinary conditions they lost their vitality in from a day and a half to three days. When the evacuations were sterilized before the cultures of the comma-bacillus were mixed with them, the organisms retained their vitality up to from twenty to twenty-five days. He was unable to come to any definite conclusion as to the cause of these phenomena.

It was demonstrated by Hesse¹⁵ and by Celli¹⁷ that many substances commonly employed as food-stuffs offer a favorable nidus upon which the cholera-organism could develop. In his experiments upon its behavior in milk, Kitasato¹⁶ found that at a temperature of 36° C. the cholera-spirillum developed very rapidly during the first three or four hours, and outnumbered the other organisms commonly found in milk. They then diminished in numbers from hour to hour as the acidity of the milk increased, until finally their vitality was lost; at the same time, the common milk-bacteria increased in number. Relatively the same process occurs at a lower temperature, from 22° to 25° C., but the process is slower, the maximum development of the cholera-organisms taking place at about the fifteenth hour, after which time they were overgrown by the ordinary saprophytes present.

From this it would seem that the vitality of the cholera-organism in milk depends largely upon the reaction—the more quickly the milk becomes sour, the more quickly the cholera-organism becomes inert, while the longer the milk retains its neutral, or only very slightly acid reaction, the longer do the cholera-organisms that may be present in it retain their power of multiplication.

In sterilized milk of a neutral or amphoteric reaction, at a temperature of 36° C., the cholera organisms grow, gradually produce an acid reaction, and retain their vitality for about two weeks. At a lower temperature, from 22° to 25° C., they retain their vitality under these conditions for about three weeks or more.

Sterilized milk into which cholera-spirilla have been introduced, when subjected, for five minutes, to a temperature of from 96° to 100° C. is rendered sterile.

According to Laser,¹⁷ the cholera-organism retains its vitality in butter for about seven days; it is therefore possible for the disease to be contracted by the use of butter that has in any way been in contact with cholera-material.

When cultures of the organism are subjected to a temperature of 65° C., all organisms are destroyed in five minutes.

In regard to the antagonism between the cholera-spirillum and other organisms with which it may come in contact, the experiments of Kitasato¹⁶ led

him to conclude that no organism has been found which, when growing in the same culture-medium with it, possessed the power of depriving it of its vitality *within a short time*. On the other hand, the experiments showed that there were quite a number of other organisms the development of which was checked, and in some cases the vitality of the organisms was completely destroyed, when growing in the same medium with the cholera-spirillum.

The most conspicuous example of the latter condition is the behavior of the anthrax-bacillus when growing together with the cholera-spirillum. In a relatively short space of time the former loses its vitality.

From this it would appear that the disappearance of the cholera-spirilla from mixed cultures in evacuations in so short a time as has been mentioned, is due more to alterations or unfavorable conditions in the media than to the direct action of the other organisms present.

When completely dried, according to Koch's experiments, cholera-organisms do not retain vitality for longer than twenty-four hours, but by others their vitality is said to be destroyed by an absolute drying of three hours. In the moist condition, as in artificial cultures, their vitality can be retained for many months, though repeated observations lead us to believe that, under these circumstances, their virulence is diminished. According to Kitasato¹⁶ they retain their vitality when smeared upon thin glass cover-slips and kept in the moist chamber for from 85 to 100 days, and for as long as 200 days when deposited upon bits of silk thread.

In the course of his studies upon the destiny of pathogenic microorganisms in the dead body, Von Esmarch²⁰ found that, when the cadaver of a guinea-pig dead from the introduction of cholera-organisms into the stomach, was immersed in water and decomposition allowed to set in, after eleven days, when decomposition was far advanced, it was impossible to find any living cholera-spirilla by the ordinary plate-methods.

A similar experiment resulted in their disappearance after five days. In another experiment, in which decomposition was allowed to go on without the animal being immersed in water, none could be detected after the fifth day.

Carl Fraenkel²¹ has shown that an atmosphere of carbonic acid is directly inhibitory to the development of the cholera-spirillum, and Percy Frankland²² states that in an atmosphere of this gas it dies in about eight days. In an atmosphere of carbon monoxide its vitality is lost in nine days, and in general the same may be said for it when under the influence of an atmosphere of nitrous oxide gas.

From what has been said we see that the spirillum

of Asiatic cholera, while possessing the power of producing in human beings one of the most rapidly fatal forms of disease with which we are acquainted, is still one of the least resistant of the pathogenic organisms known to us. Under conditions most favorable to its growth, its development is self-limited; to acids, alkalies, disinfectants, and heat it is conspicuously susceptible; but when partly dried upon clothing, food, or other objects, it may retain its vitality for a relatively long period of time, and it is more than probable that it is in this way that the disease is carried from points in which it is epidemic or endemic into localities that are free from the disease.

ORGANISMS WITH WHICH THE SPIRILLUM OF ASIATIC CHOLERA MIGHT BE CONFOUNDED.

In 1885 Finkler and Prior contested the significance of Koch's comma-bacillus in Asiatic cholera; for they claimed to have found it in the dejections of individuals suffering from cholera nostras.

Not only has Koch, but also Van Ermengen and others have satisfactorily demonstrated how significant are the biologic and morphologic differences between the organism found by Finkler and Prior and the Asiatic cholera-organism, and that the opinion of Finkler and Prior is most probably based upon the incompleteness and inaccuracy of their method of experimentation. At a later period Finkler and Prior were themselves compelled to admit that the organism described by them was pathogenic only for cholera nostras.

Subsequently, in 1885, '86, and '87, Franck²⁸ examined seven cases that clinically presented the condition of cholera nostras; in none of these seven cases was the organism of Finkler and Prior, which they claim to be the cause of the disease, found.

In all cases, the results of bacteriologic examination, in so far as the constant presence of an organism that might stand in causal relation to the disease was concerned, were negative. Only the ordinary intestinal bacteria were found.

The spirillum of Finkler and Prior is thicker and longer than that of Koch; they are thicker at the poles than at the middle, and form, like the comma-bacillus, screw-like, twisted threads. In hanging-drop cultures one sees that this organism is motile. In plate-cultures they form round, isolated colonies. These are darker than the colonies of Koch's spirillum; their surface is neither so glazed, nor conspicuously granular; the edge is regularly circular and not indented. The most conspicuous differential characteristic is that they liquefy the gelatin much more energetically than does the Koch organism, and thereby bring about a diminution in the characteristic outline of the colony. The outer

edge of the liquefying zone shows a sharp contour, as does also the organism of Koch.

A plate upon which only the colonies of the bacillus of Finkler and Prior are growing will become completely liquefied in summer at the temperature of the room, in less than forty-eight hours, assuming the appearance of a yellowish-white, semi-fluid mass having a peculiar odor. In stab-cultures at the room temperature, twenty-four hours after the inoculation, liquefaction is noticed about the needle-track; the liquefaction at the upper part of the canal becomes greater and greater, and after three days the entire upper portion of the nutritive gelatin has become converted into a cloudy fluid, whereas, at the lower part of the canal, the liquefaction progresses less rapidly, and the whole mass in the tube now presents an appearance the outline of which has been likened to a single finger of a glove, with the hand of the glove attached.

The bacillus of Finkler and Prior grows upon potato at the ordinary temperature of the room, which is not the case with the comma-bacillus; and after forty-eight hours the surface of the potato is covered with a greenish-yellow deposit. There is nothing specially characteristic about its growth on agar-agar. It liquefies blood-serum.

There is another comma-bacillus which occupies, in its cultural peculiarities, an intermediate place between that of Koch and that of Finkler and Prior. This is the spirillum found by Denecke²⁹ in old cheese. Under the microscope this bacterium is smaller than Koch's; it is motile; it liquefies gelatin more rapidly than Koch's bacillus, and less rapidly than that of Finkler and Prior. In stab-cultures one might easily confound it with the organism of Finkler and Prior. Under no circumstances does it grow on potato, and it energetically liquefies blood-serum.

Another comma-bacillus is that described by Miller,³⁰ obtained from a carious tooth; it has so much the same characteristics as the organism of Finkler and Prior that Miller was induced to consider the two identical.

The introduction of cultures of these organisms into the intestinal canal of animals by the method of Koch resulted as follows: Of fifteen animals treated with the spirillum of Finkler and Prior five died; of fifteen treated with the organism of Denecke three died; and of twenty-one treated with Miller's spirillum only four died. The conditions found at the autopsy were not those of cholera, and it was impossible to obtain any regularity in the results of the experiments.

Another spiral organism that might be confounded with that of Koch is the vibrio Metschnikovi, described by Gamaleia,³¹ which he found *post-mortem* in a number of fowls that had died in the poul-

try markets of Odessa. If the description given by Gamaleia is correct, then there should be no difficulty experienced in differentiating these two organisms, for in milk after a few days at 35° C. there is a coagulation, with acid reaction and precipitation of the casein. At 25° C. the vibrio Metschnikovi grows on potato as a pale coffee-colored deposit that is darker in color toward the center of the growth. On agar-agar its growth is rapid, giving rise, after a few days, to a yellowish deposit. In gelatin stab-cultures the growth is more rapid, but very similar to that of the true cholera-spirillum. On gelatin plates there appear usually colonies of different appearance, the one set having many similarities to the organism of Koch, while the others approach very closely the spirillum of Finkler and Prior. Gamaleia states that the vibrio Metschnikovi forms veritable endogenous spores, a point that, if true, serves to differentiate it at once from the organism of Koch, though the statement is not confirmed by others who have worked with cultures of this organism.

In many respects, both morphologic and cultural, this organism is similar to the spirillum of Asiatic cholera, though, from the points cited, it is seen that the former can be differentiated from the latter; moreover, in its relation to animals the vibrio Metschnikovi is evidently a distinct species, for it is highly pathogenic both by subcutaneous and intramuscular inoculation for pigeons, chickens, and guinea-pigs—a property not possessed by the true spirillum of Asiatic cholera.

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- ²³ Franck: Zeitschrift f. Hygiene, Bd. iv, p. 207.
- ²⁴ Denecke: Deutsche med. Wochenschrift, 1885, No. 3.
- ²⁵ Miller: Deutsche med. Wochenschrift, 1885, No. 9.
- ²⁶ Gamaleia: Annales de l'Institut Pasteur, 1888, tome ii, p. 482.
- ²⁷ Celli: Bolletino della R. Accad. Med. di Roma, 1888.

ETIOLOGY AND TREATMENT OF ABORTION.¹

BY W. REYNOLDS WILSON, M.D.,
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THE causation of abortion depends not upon the hemorrhage into the decidua, which is present, but upon some primary lesion, the result of a pathologic condition in the mother or the child. As a basis of the pathologic changes occurring in abortion we are, in most instances, able to find some histologic lesion. There are cases, however, in which we must fall back upon reflex causes to explain the condition. Such terms as "irritable uterus," "habitual abortion," etc., are used to designate the latter class of cases. These terms are not without their proper use, as every practitioner has met with cases in which no cause, either during pregnancy, at the time of the abortion, or following the abortion, will answer as an explanation of the condition. By a more careful study of these cases we are often able to detect a cause which is acting reflexly, such as irritation of the nipples, chronic congestion from repeated coitus, or mental emotion; or, by internal examination, we find a laceration of the cervix. This last condition may be associated with retraction of one or the other broad ligament, and with pelvic adhesions that hold the uterus out of its proper axis. The uterus thus bound down cannot accommodate the growing fetus, and is excited to contraction—a condition standing thus on the border-line between the reflex and the tangible causes of abortion. The occurrence of the latter set of causes we shall allude to at a later time.

There are a number of causes that act reflexly upon the uterus, the organ itself being unaffected, and therefore the epithet of irritable uterus is inadmissible. In chorea, eclampsia, and excessive vomiting we have the uterus excited to spasmodic action. In all these conditions the state of muscular spasm is capable of producing the result either by forcing the uterus to discharge its contents by the contraction of the diaphragm and the abdominal muscles, by venous stasis interfering with the oxygenation of the fetal blood, or by producing a state of physical exhaustion. The condition in eclampsia, while embracing these factors, presents a still more important element in the causation, namely, the presence of a toxic principle in the blood—urea, acetone, or a combination of poisons.

¹ Read before the Northern Medical Society, May 13, 1892.

The condition of the blood in the infectious diseases may also bring on abortion. This may result from high temperature, as in typhoid fever, or from blood-changes, as in pneumonia. In other words, abortion may result from all those conditions that produce, first, an elevation of temperature; secondly, a condition of hyperemia in the pelvic organs, with the accumulation of carbonic acid; and, thirdly, excessive changes in blood-pressure, resulting in deficient nutrition of the fetus.

Positional disorders and changes in the situation of the uterus by reason of adhesions and exudates play an important rôle in the etiology of abortion. The following notes are from a case in which repeated abortions were referred to the existence of pelvic adhesions binding the uterus downward and drawing it from its proper axis:

H. M. S., aged thirty-six years, was seized with labor-pains on December 24, 1890. The family history, and the personal history up to the date of the first miscarriage, were good. The husband's history was also good. The patient had been married thirteen years, and she had had six miscarriages, all at about the sixth month. The present labor occurred in the beginning of the seventh month; the first stage lasted fourteen hours, the child presenting by the breech, with prolapse of the cord. The child was extracted, and was kept alive for thirty-two hours by means of an Auvard incubator. The uterus was bound by adhesions toward the right. The early history of pelvic trouble causing these adhesions was obscure, although a perimetritis incident to the earliest abortion may account for their existence. In this, as in all of her previous pregnancies, the interference with the development and ascent of the uterus caused the contractions, with the resulting miscarriage.

An examination in the intervals between the pregnancies, with the idea of diagnosing the precise condition, might throw some light upon the possibility of the existence of a uterus bicornis, one horn of which has remained rudimentary, the other being displaced by pelvic adhesions—a condition that could readily account for the occurrence of repeated abortions.

Retroversions, retroflexions, and prolapse are the chief positional affections of the uterus that interrupt its evolution and interfere with the proper nutrition of the ovum, on account of the endometritis that is secondary to these conditions. Myomata and ovarian tumors, as well as cicatricial stenosis of the vagina, with fixation of the cervix, must also be included among the conditions that produce abortion.

On the side of the child, malformations, such as spina bifida and anencephalus, are in some cases accountable for abortion. The writer presented a case, however, in the *American Journal of Obstetrics*

for October, 1891, in which a fetus affected with cystic elephantiasis involving generally the subcutaneous connective-tissue, and associated with hydramnios and beginning myxomatous degeneration of the placenta, was carried to the middle of the eighth month, and lived for thirty minutes after delivery.

Diseases that cause the death of the child are accountable for its premature expulsion. Among these diseases syphilis is the most important—syphilis communicated by the mother or by the father, and acting directly upon the fetal tissues, or interfering with the nutrition of the fetus through the lesions in the placenta and cord. If acting directly upon the fetal tissues, there is produced the well-known picture of congenital hereditary syphilis, namely, ascites and anasarca, the result of chronic, diffuse, interstitial hepatitis, gummata in the liver, spleen, pancreas, kidneys, and lungs, together with the presence of osteo-chondritis at the apophyses and the epiphyses of the long bones, and presenting the distinct yellow line which is so often observed; the lesions in the cord consist in thickening and edema, with increase in the thickness of the intima of the veins and arteries, as a result of which the lumen of the vessels is encroached upon. Torsion of the cord is of frequent occurrence. When the placenta is affected we have the following lesions: According to Winckel, fatty degeneration and thickening of the decidua, small-celled infiltration, infarcts (wedge-shaped, with the base of the wedge directed toward the uterine decidua), and cloudiness of the villi, the nuclei of which are unaffected by staining, the vessels occluded, and the epithelium absent. According to Greene, we have an amyloid degeneration; that is to say, a peculiar chemical change of the ground-substance of the villi and decidua, associated with analogous changes in the amnion and tissue of the cord.

Placenta previa and kidney disease must be included among the causes of abortion.

Looking more carefully into the histologic changes that accompany abortion, we may consider them in the following order:

First: A condition of hydremia of the mucous membrane of the gravid uterus, in which the secretion of a serous fluid, beginning usually not earlier than the third month of pregnancy, causes the premature discharge of the ovum.

Second: A thickening of the decidua, which affects sometimes the whole of the decidua vera, and at other times only a localized area, producing in the latter instance a polypoid hypertrophy. This condition, known as *endometritis decidua chronica*, has been observed in women who, before pregnancy, have suffered from chronic endometritis, of gonorrheal, syphilitic, or simple origin.

Third: Irrespective of the hemorrhage resulting

from the death of the embryo, we may have hemorrhage occurring in the course of the lesion just described, as well as primarily in the decidua, which presents, in such cases, areas of inflammatory change. If the bleeding occurs repeatedly and coagulation takes place, the fibrin with the decidua which has been permeated by the clot forms a mass that has received the designation of fleshy mole. With the dislodgment of such a mass the fetus, in a state of retrograde change, is sometimes discharged; at other times, especially when the hemorrhage has occurred at an early date, it is absorbed.

In the later months of pregnancy the changes confined to the decidua serotina assume distinct importance, as upon these changes depend the function of the placenta. The most important lesion consists in thrombosis of the intervillous sinuses. The minute yellowish-white areas thus formed, distributed in the maternal surface of the placenta and resembling infarcts of the spleen, have by Fehling been designated white infarcts; but, according to Ziegler, their origin is to be attributed to thrombosis. These points of thrombotic origin consist of areas of laminated fibrin that have undergone a hyaline degeneration. Their significance lies in their frequent association with the lesions of syphilis in the mother. They appear, however, in great numbers in the placenta of women not affected with syphilis, and, according to Fehling, are associated with chronic nephritis. Their origin lies either in an abnormal condition of the blood, or in a pathologic condition of the villi.

In considering the treatment of abortion we shall take up the prophylactic treatment, bearing, as it does, upon the pathologic changes that we have just discussed. We must first combat the general affections that predispose to abortion, such as syphilis, nephritis, and heart-disease; while, in cases of acute infectious disease, we must endeavor to prevent abortion by controlling the symptoms. In cases in which pelvic trouble is present it will be necessary to correct this. Endometritis is the direct cause of abortion in the majority of cases belonging to this class, whether the primary cause be a positional or an inflammatory disorder. In studying the pathology of abortion we have been able to trace the lesions in the decidua to an abnormal condition of the mucous membrane of the uterus before impregnation. The origin of this condition depends, in many cases, upon gonorrheal infection. In the last few years gonorrhea has been recognized as the origin of a large class of tubal affections; its bearing upon the causation of endometritis, predisposing to abortion, is of equal importance.

In threatening abortion, rest and the use of opium, either by enema or suppository, will meet the indications for treatment. The probability of averting

the abortion depends upon the degree of dilatation of the os, the amount of hemorrhage, and the presence of uterine contractions. In actual abortion the existence or non-existence of hemorrhage determines the treatment. If the bleeding is moderate and the cervix undergoing dilatation, the treatment should be purely expectant, and ergot should be used in repeated doses as required. If, on the other hand, the bleeding is excessive, the practitioner should be prepared, not for temporizing measures, such as the use of tampons, but for the most active procedures. Those who advocate tamponing would be unwilling to hear of it as a "temporizing measure;" its effectiveness in exciting uterine contractions and furthering dilatation is a strong argument in its favor, but the dangers from the retention of the blood by the tampon and the risk of infection more than counterbalance the advantages of this form of treatment.

When serious hemorrhage has taken place, the more rapidly dilatation is completed, as a means by which the contents of the uterus can be reached and turned out, the more effective the treatment. For this reason we resort to rapid digital dilatation and the removal of the ovum by means of the finger swept around between the placenta and the uterine wall. In the latter months (the fourth or fifth month) pressure over the fundus will often expel the contents of the uterus intact. Specimens of gestation-sacs, made up of the decidua enclosing the fetus floating in the amniotic fluid and surmounted by the cap-shaped placenta, are frequent in every museum. Such specimens stand for the good judgment of the accoucheur, for, if we allow the membranes to remain intact, the ovum is in time expelled complete. If, however, the membranes have been ruptured, and, in the event of hemorrhage, they cannot be detached by the finger, the curette must be used, followed by the careful cleansing of the uterus by intra-uterine douches. Should part of the membranes or placenta be retained, without the presence of hemorrhage or fever, manual or instrumental removal should be avoided, as by the most careful procedures we cannot escape the risk of leaving some shreds within the cavity of the uterus, and, in the use of the curette, of infecting the uterine surface. If decomposition of the retained mass has set in, with the appearance of fever, we should resort to the use of the curette.

In case shreds of decidua are retained and infection from the uterine surface has occurred, leading either to pelvic exudation or acute peritonitis, what should be our line of treatment? In the *American Journal of Obstetrics* for April, 1892, Pryor reports a case in which he had curetted the uterus for the relief of acute peritonitis following abortion. The uterus was curetted and packed with iodoform-

gauze. The peritonitis subsided, the uterus became movable, and the tenderness disappeared. Polk, in discussing this paper, supported the treatment, and alluded to the further procedure of opening the abdomen, if necessary, after curetting and treating the peritonitis by drainage—a procedure reserved, fortunately, for a limited class of cases.

It remains to describe an unusual condition that has been overlooked in the category of sequelæ requiring treatment. In the course of two weeks, or even a longer time, after the removal of the placenta, with the cessation of hemorrhage and the disappearance of all symptoms, the patient is seized suddenly with bearing-down pains and hemorrhage. Examination reveals a polypoid growth protruding through the relaxed cervix. This condition is due to subinvolution of the uterus at the placental site, with the leakage of blood which has become organized. The sinuses remain open, and the congestion increases until some unusual exertion on the part of the patient induces hemorrhage. The treatment consists in the removal of the mass by the finger or by the curette, and the administration of ergot to overcome the subinvolution.

SOME INCIDENTAL PHENOMENA OF THE SHADOW-TEST.¹

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As with all other methods of determining refraction, the shadow-test has been undervalued by some, and, perhaps, overestimated by others; but I think that no one who has used it long, with a knowledge of its underlying principles, can have failed to recognize its great advantage in certain classes of cases, and its assistance, as a control-method, in all. Infallibility, or an accuracy closer, in the majority of instances, than 0.5 D., should not be claimed for it. As I have elsewhere stated,² one obstacle to its more general use is the want of a handy method of employing it, a fault that I have endeavored to overcome by using a disc whose periphery is set with a series of lenses that can be brought in rapid succession before the eye to be examined.³ Though I have found the method generally reliable, and use it,

¹ Read before the American Ophthalmological Society, at New London, Conn., July 20, 1892.

² "Skiascopy, with a Description of an Apparatus for its Ready Employment." Knapp's Archives, No. 2, 1890.

³ I think it should be stated, in this connection, that the instrument constructed and advertised by Queen & Co., of Philadelphia, as "Würdemann's Skiascope" differs in no essential particular from that exhibited by me at the meeting of this Society in Washington, in 1889. Dr. Würdemann, I am informed, had some made in Vienna, with his name attached, in 1890.

by routine, in every case of refraction that I examine, there are some incidental phenomena that I have observed in a number of cases which seem to be of sufficient importance to have attention more pointedly directed to them than heretofore.

When the refracting media are uniform in curve and transparency, the illuminated area, with its shadowy edge, which moves across the pupillary space, is of an even reddish color, and, in its passage from side to side, through the rotation of the mirror, is unchanged, except sometimes when the faint shadow of a large retinal vessel obtrudes itself. I have found, however, that this illuminated area is by no means constantly uniform. In quite a percentage of cases there is within this space a very appreciable play of shadows, more or less crescentic, which change their position and shape with each change in the position of the mirror, exactly in the same manner as we have it in conical cornea, only, of course, in not so pronounced a degree. These appearances must come necessarily from some obstacle to the regular refraction of the rays, proceeding from the illuminated retinal area, in their passage outward to form the aerial image of this spot at the far-point of the eye. These internal shadows are best observed when the plane mirror is used and the illumination is weak.

Exactly where the defect lies I have not as yet been able to determine. The appearance and movements of the shadows are so like those of conical cornea that one's first thought is naturally toward some change in the corneal curvature. But every case in which the phenomenon was at all pronounced was examined carefully by the ophthalmometer of Javal, the measurements being taken at every five degrees along the principal meridians, from the line of the visual axis to the periphery of the cornea, in the manner described in my paper on the "General Form of the Cornea," etc.,¹ and in only a single instance did the change in the corneal curve deviate from that of corneæ which can be considered normal, sufficiently to account for the phenomena. Neither did the corneal reflex of Placido's disc show any marked change in the size or form of the rings.

I have excluded from this consideration all cases in which even the slightest trace of a corneal or lenticular opacity was discernible by ordinary oblique or direct illumination. In some cases, however, there was a history of a previous inflammation of the eye, and it is possible that an inflammation of the cornea might have healed with a normal surface-curve, but with some permanent change in the density of the tissue beneath, which would not reveal itself by the usual methods of examination as a clearly defined opacity.

¹ Read at the same meeting of the Ophthalmological Society.

My next thought was that the irregularity might be due to a conicity of the lens, or, at least, an irregular curve, on one or both of its surfaces. Of the existence of such irregularity I have not been able to satisfy myself by the Sanson-Purkinje experiment. However, I think the method is not sufficiently refined to be of any use in determining small irregularities of curve. Then there comes in another possible cause—variations in the density of the lens-tissue. Pronounced opacities in the lens, such as we find in commencing cataract, and particularly when the nucleus is first or most affected, do unquestionably give rise to these shadows, but the instances in which I have found them most pronounced have been in young people in whom there was no reason to suspect any pathologic change in the lens.

Another feature which has shown itself in many of these cases is one that tends to set a limit to the reliability of the test. In a number of instances in which I have observed this phenomenon there has been a want of correspondence between the lens that gave a reversal of the shadow movement and the glass that gave the best visual acuteness. Of this, the following case is an example:

Miss E. F., aged eighteen, has vision in either eye of $5/18+$, and so far as she remembers it has never been any better. The cornea, examined at the visual axis, gave an astigmatism of 0.5; according to the rule. Skiascopy gave a general M. of 1.5 D. As minus glasses of any strength failed to improve vision, she was put under a mydriatic. The shadow-test still gave, with the dilated pupils, a reversal of movement only with -1 D. at two meters examining distance. Her best vision, however, was obtained with -0.5 , 90° L., 100° R., when it was barely $5/9$. The crescentic unstable shadow within the illuminated area was very marked, and in the direct ophthalmoscopic examination there was observed that changing in the distinctness of a retinal vessel along its course, or with a shifting of the mirror, which is so characteristic of conical cornea. An examination with Placido's disc did not reveal any noticeable change in the form or course of the rings. The cornea was measured in its principal meridians at intervals of 5° from the visual axis up to 20° on each side. The measurements of the left cornea expressed in diopters of refraction are given in the following table:

Degree.	In.	Out.	Down.	Up.
0	44	44	43.5	43.5
5	44	44	43.5	43.5
10	43.5	44	43.5	43.5
15	43	44	43.5	43.5
20	42.5	43.5	43.5	43.5

From these measurements it will be seen that the corneal curve is much more regular than the average as exhibited in the table in my paper on the "General Form of the Human Cornea."

Mr. O. R., aged eighteen years, has in R. vision $5/18$ with $+2$, 100° . Skiascopy, on repeated examination, gives invariably $+1.75$, 180° and $+4.90^\circ$ in the same eye. The ophthalmometer reveals 1.25 D. of astigmatism, according to the rule, at the visual axis.

The general corneal curve is not abnormal. The unstable shadows within the illuminated area are very marked. He said he had had granular lids when he was younger, but there are no corneal scars visible by the usual methods of examination.

Mrs. S. R., aged thirty-three years. $V = 5/6$, and no glass improves. Skiascopy gives 1.75. Corneal curve regular and not abnormal. Shadows quite pronounced.

Miss E. M., aged twenty-three. $V = 5/6$. No glass improves. Internal shadows very pronounced. The shadowy edge in skiascopy was so ill-defined that nothing definite could be learned from the movements. Corneal curve normal.

Mrs. H. B. W., aged thirty. Under homatropine R., $V = 5/12$, with $+0.75$ $\odot +1$, 165° ; ophthalmometer at visual axis 40 D., meridian at 30° , 39.5 D., meridian at 120° . She had inflammation of the eyes in childhood, but there are no corneal scars visible. The corneal curve is normal, except at the upper inner portion, where it becomes slightly irregular. The internal shadows are very marked. In the other, L., eye, the shadows are less marked, and the corneal curve is normal in both principal meridians. $V = 5/6$.

In some cases in which the internal shadows were clearly discernible the visual acuteness was normal, but in none have I seen it exceed $5/5$. In no case, however, in which it was at all pronounced, have I seen the acuteness of vision come up to the standard.

It would seem, therefore, from this, that the shadow-test is to be relied upon implicitly only when there is perfect regularity in the refraction, and, as a converse corollary to this, the method is one of great value in detecting such irregularities when they are not otherwise determinable.

CLINICAL MEMORANDA.

A CASE OF AKROMEGALY.¹

BY CHARLES W. DULLES, M.D.,
OF PHILADELPHIA.

THE subject of akromegaly was brought before the College last January and April, when Dr. F. A. Packard read a paper on this subject and a disease that simulates it (osteo-arthritis hypertrophiant pneumique—Marie), and Dr. Dercum exhibited two patients with akromegaly. Since that time, to confirm the commonly entertained opinion that an unusual occurrence is likely to be soon followed by others of the same sort, a case of akromegaly has unexpectedly presented itself to me.

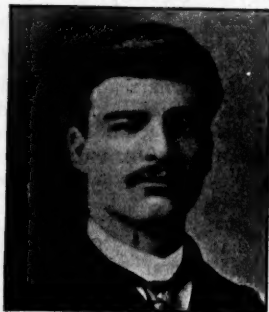
On July 7th, in the house of a Syrian client, I was asked

¹ Read before the College of Physicians of Philadelphia, October 5, 1892.

to examine and treat a friend who was newly arrived from Constantinople. The following account describes what I found:

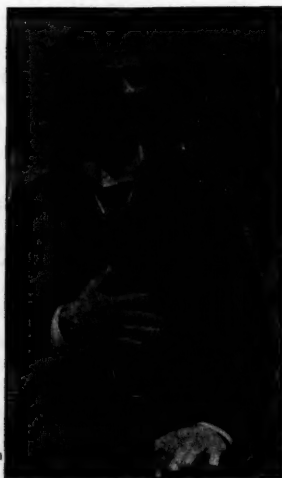
A. P., born in Turkey in Asia, twenty-seven years of age, unmarried; height, five feet seven and a half inches; weight, about 160 pounds; has a good family and personal history, having lost two brothers in infancy and having five now living and healthy, and both parents living. Six years ago he was in this country, doing business in Chicago. As the accompanying photograph (Fig. 1), taken at that time, shows, he was then a well-

FIG. 1.



formed and healthy young man. After this he went to Constantinople to carry on the Oriental part of a business that consisted in buying rugs, etc., and sending them to this country to be sold. Owing to involvement in the affairs of those for whom he acted, he was accused of violating the laws of the Ottoman Empire, and

FIG. 2.



on March 4, 1890, was cast into a Turkish prison, where he remained for about eighteen months—until August 27, 1891. On leaving the prison he had no business, and was under a cloud of distrust and depression until he left Turkey to come to America, where he arrived fifteen days before I saw him.

While he was in prison his hands and feet began to

enlarge, so that everybody said that he was getting fat, and his shoes (sandals) became too small for him. About six months ago, he says,¹ he began to be oppressed with drowsiness, especially after meals, when he could hardly speak, but had to lie down and take a nap. For about three months he has had profuse sweats.

When I first saw him he presented an appearance of melancholy, and a face that at once suggested to my mind the condition described by Marie as "akromegaly," and what appeared in the patients exhibited to the College last April by Dr. Dercum. The second photograph (Fig. 2) brings out the peculiar, massive, leonine countenance, the broad forehead, the wide malar eminences, the large mouth, the broad lower jaw, the large chin, the thick lips, the transverse wrinkles of the forehead, which make up the facial picture of akromegaly, and which are in marked contrast to the face in the photograph taken six years ago. Figure 3 shows the

FIG. 3.



feet. In addition to what the photographs show, it may be stated that there is lateral projection of the rami of the jaw, which is also enlarged, especially in the transverse direction. The form of enlargement generally seen in akromegaly seems to be an increase in the perpendicular and antero-posterior measurements, so that the teeth of the lower jaw overlap those of the upper, and the face is of an oval cast. In the present instance the lower jaw seems to be enlarged, in common with the whole of the bones of the face, except that its breadth is disproportionate. Standing behind the patient at a distance of a few feet, both rami are plainly seen extending beyond the lines of the neck. This is not the case in normally formed individuals, in whom the rami of the jaws are not visible, or only barely so, when looked at from behind the subject. The wideness of the lower jaw is conspicuous on putting the fingers into the mouth and passing them between the upper maxilla and the ramus of the lower jaw, in which situation the coronoid process can be plainly felt quite outside of the superior maxilla. From the outside the articular process of the lower jaw can be seen and felt through the auditory meatus, sliding far forward when the mouth is opened, and moving back as it is closed. The

¹ The periods are not quite trustworthy because the patient does not seem to remember dates accurately.

lateral enlargement of the lower jaw caused the lobes of the ears to protrude and the lower part of the ear (tragus and antitragus) to stand further from the middle line than the upper parts of the concha. The teeth of the lower jaw are somewhat separated, but they fall within the line of the upper teeth.

The hands and feet are characteristic. The former are large, and have the "sausage-shaped" fingers described by several writers. The feet are very large, and have the fleshy pad along the outer side, which is spoken of as peculiar to this disorder. There is also a thick pad under the os calcis and somewhat in advance of it on the sole of the foot.

A careful physical examination did not disclose any evidence of organic lesion of any of the thoracic or abdominal viscera. The urine presented no peculiarities on chemic and microscopic investigation. The eyes were examined by Dr. George E. de Schweinitz, whose friendly interest in the case was increased by the fact that he has already examined the eyes of other persons suffering with akromegaly.

Dr. de Schweinitz reports his findings as follows:

"The optic disc of the right eye is irregularly oval, of normal color, having at its nasal side a slight crescent. The fiber-layer of the retina in the neighborhood of the optic papilla is slightly hazy. There is a faint general absorption of the pigment-epithelium. The central vessels are normal in size and carry naturally-colored blood.

"The optic disc of the left eye is a vertical oval; its nasal side is bounded by a pigment-line and its temporal side by a sharply marked greenish border. Otherwise the conditions are the same as in the right eye.

"In the right eye there is compound myopic astigmatism; 1 D. of corneal astigmatism with its axis horizontal. In the left eye there is simple myopic astigmatism; 2.50 D. with its axis at 15. With correction of the refractive anomaly:

O. D. — 2 \ominus 1 cyl. ax. H. 6/IX.

O. S. — 2.50 cyl. ax. 15 6/IX.

"The pupils are round, equal in size, and react to the changes of light and shade, convergence, and accommodation. The pupillary reflex is more marked when a beam of light is thrown upon the right side of each retina than when thrown upon the left, but the hemiopic pupillary inaction (Wernicke's symptom) is not present.

"There is no paralysis of any external ocular muscle. The fusion power is good, and there is esophoria (insufficiency of the external recti) of 2 degrees.

"There is *typical left lateral hemianopsia*, with great contraction of the preserved field of vision, the contraction being the greater upon the right side. The dividing line between the dark field and the preserved field passes slightly in advance of the fixation-point. The color perception is normal in the central area, and there is a normal sequence in the appreciation of the colors in the area of preserved vision.

"The interesting feature of this case, so far as the ocular symptoms are concerned, is the presence of left lateral hemianopsia, a hemianopsia, moreover, that is probably due to a lesion back of the primary optic centers, inasmuch as there is preservation of the function of the sensori-motor arc of the pupil and the absence of Wernicke's symptom. The lesion would seem to be

located in some portion of the visual tract posterior to the centers just named. Ordinarily in hemianopsia, when there is concentric restriction of the remaining half-fields, this is greatest in the eye opposite to the lesion. In the present instance precisely the contrary condition obtains, the greatest restriction being found upon the right side, while the character of the hemianopsia (left lateral) shows that the lesion that creates it must be upon the right side of the brain. Independent of an organic cerebral lesion, it is perfectly possible that a hemianopsia might be present under the influence of hysterical manifestations. A number of such cases have been reported. In several of the cases of recorded akromegaly, bi-temporal hemianopsia has been present. This, then, is peculiar in being an example of left lateral hemianopsia associated with this affection. It is quite possible that it is purely an association, and has nothing to do with the disease itself."

From this report it will be seen that the patient has a form of hemianopsia that is peculiar, in that it is homonymous, whereas in akromegaly the hemianopsia is usually bi-temporal.

Taking the picture of akromegaly drawn by Marie, we find this man's case to resemble it, in that there have been depression of spirits, profuse sweating, intense thirst, voracious appetite, great lassitude and drowsiness, especially at and after meals, severe and protracted headaches and marked melancholy of disposition, together with the enlargement of hands, feet, and face that are considered to be peculiar to this curious ailment.

Akromegaly is by no means as rare a disorder as might be supposed from the fact that only a few cases have come to the notice of medical men in this country. The often-quoted essay of Dr. Pierre Marie and of Dr. Souza-Leite (London, New Sydenham Society, 1891) contains brief accounts of forty-eight cases gathered from various authors, the earliest being that of the French surgeon Saucerotte, published 116 years ago (1776), and Dr. O. T. Osborne, of New Haven, in an interesting report of a case he had studied (*Amer. Journ. of the Med. Sciences*, June, 1892), speaks of it as the eighth case reported in the United States.

The reasons for considering this a special disorder, and the differences between it and osteitis deformans and leontiasis ossea, are fully discussed by Marie and his pupil Souza-Leite, and will, I think, satisfy any candid reader. According to Marie, the peculiarity of akromegaly consists in a marked enlargement of the bones and of the overlying tissues in the hands and feet, and also in the face, while the bones of the skull and of the trunk are usually unaffected. The enlargement of the bones causes a typical appearance of the face and of the extremities. The visible changes seem in many cases to be the consequence of profound distress or depression, and they are accompanied by lethargy of mind or even melancholy, with drowsiness, headache, extreme thirst, and sweating. In a number of cases hemianopsia has been observed. This curious manifestation should be looked for in every case until enough cases have been investigated to establish the importance to be attached to its presence as a symptom, and the exact form of it. As already stated, the case that I have described presents a form of hemianopsia which differs from that

which has heretofore been described. The case differs also in the mode of enlargement of the lower jaw, and these very differences make it the more desirable, I think, to put the case on record; for the literature of the subject is still very restricted, and it may be that with a larger material for study, there may be some modification of our ideas as to what is essential to the disorder.

An interesting contribution to this literature is an essay¹ supplied by Professor Mosler to that remarkable monument in honor of Virchow's semi-centennial celebration, the *Internationale Beiträge zur wissenschaftlichen Medicin*.

The patient whose case I have described was sent by me to Dr. Packard and to Dr. de Schweinitz for examination, and would be before you to-night but that he wearied of treatment (in a hospital) and left the city.

The treatment to which the patient was subjected was directed chiefly to the digestive tract, which was much out of order. An obstinate constipation was broken up; a suspicion of lumbricoids (a very common affliction of Turks and Syrians) was followed up until it proved ungrounded, salol and phenacetin were given for headache, and strychnine was given as a general and nerve tonic. During the month in which the man was under my care he improved in some respects; but the improvement was solely in regard to the state of his digestive apparatus and the state of his mind. At times he acquired a certain degree of cheerfulness, but this did not last long. On leaving the city for a short summer holiday I had the patient admitted to a hospital, and on my return I found that he had decided to leave it, and that he had also left the city.

A CASE OF AKROMEGLALY.²

BY SOLOMON SOLIS-COHEN, M.D.,

PROFESSOR OF CLINICAL MEDICINE AND APPLIED THERAPEUTICS IN THE PHILADELPHIA POLYCLINIC; ONE OF THE PHYSICIANS TO THE PHILADELPHIA HOSPITAL, ETC.

THE case of akromegaly herewith reported I met with accidentally. The subject is not aware that he has any disease, and while he has kindly given me permission to publish his measurements and photograph, he has stipulated that the face should be rendered unrecognizable. This has been skilfully accomplished by retouching the photographs prior to reproduction. Untouched photographs are presented for the information of the Fellows of the College. I saw the man attempting to engage in athletic sport, and was amused by the way in which the big, burly fellow was literally played with by a much smaller man. He is a native American, and born of native-American parents, of English stock. He is six feet two and a half inches in height, and apparently of great muscular development. At the age of sixteen years he weighed one hundred and eighty pounds. His present weight, at the age of twenty-five years, is two hundred and thirty-eight pounds. Up to four years ago he was a blacksmith, and was then able to wield a thirty-pound sledge. Now he cannot lift much weight, and cannot vie with smaller men in athletic

exercises of any kind. He is clumsy and sluggish in movement, and although he can run long distances (four miles) without becoming "winded," he is quite slow. He has not spontaneous or intense headache, though headache may be brought on by close study; occasionally he has confusion of ideas. He claims to have a remarkable memory for facts in history and literary quotations, but he finds difficulty with mathematics or other studies requiring deep thought. This is not necessarily abnormal. He has periods of drowsiness. His appetite is exaggerated. He has not noticed excessive thirst or polyuria. A single examination of the urine failed to disclose the presence of albumin, sugar, or tube-casts.

The thickening and dumpiness of the fingers are quite characteristic. The hands (Fig. 1) are enlarged laterally

FIG. 1.



rather than longitudinally, having a characteristic spade-shape. The skin is thick and tough, and the fine lines almost obliterated, while the main furrows are coarse and deep. The segmentation of the fingers is thus quite marked in the photograph. The nails are short and broad, not striated. The grasp is not strong. I was able to endure without wincing his greatest pressure upon my own hand.

His feet are broad, flat, large and fleshy, and he has had to increase the size of his shoes, more particularly in breadth, within two years.

In two years the size of his hat-band has twice been increased, from six and three-quarters to seven, and now to seven and a half. His nose and ears have been large since boyhood, but his nose has lately much increased in size. Three years ago he first noticed the increase in the size of other features and a changed expression of

¹ Ueber die sogenannte Akromegalie (Pachyacrie).

² Read before the College of Physicians of Philadelphia, October 5, 1892.

his face, and at his last vacation his family noticed that in the nine months of his absence from home his physiognomy had altered considerably. At the age of sixteen years he thinks that he was as tall as he is at present.

His father and brothers are tall men, but their noses and hands, the man distinctly states, are unlike his. They do not stoop. Very noticeable in his attitude is his stoop forward—the cervico-dorsal kyphosis, with a tendency to forward thrust of the head (Fig. 2). This

FIG. 2.



is likewise shown negatively in a photograph (Fig. 3) by the manner in which he has thrown the trunk backward from the waist in order to get the head into a vertical position. The varicose condition of the veins of his legs also attracted attention. There is a slight paunching of the abdomen. The nose is large, thick, characteristic. The patient states that it is "growing." The superciliary ridges are prominent, the frontal sinuses much enlarged, giving a characteristic forehead, as is well shown in the profile (Fig. 3); the malar bones are enlarged, projecting laterally, so that the outline of the face is the typical lengthened ellipse of akromegaly.

The ears are large, standing out at right angles with the head, and the cartilages are thickened almost to rigidity. The lips are thick and the lower lip overhangs the chin. The tongue is broad, thick, deeply furrowed. The lower teeth do not project beyond the plane of the upper, although the chin is much enlarged vertically. The scapulae are enormous, and the acromion and coracoid processes can be easily demonstrated, while the distance between them seems to be quite great. The sternal extremities of the clavicles stand out prominently as knobs. The sternum is unusually long, and the xiphoid process is apparently ossified.

The thyroid cartilage is large, thick, and gristly; the cricoid is apparently ossified; internally the larynx

is large, but presents no abnormality. Although the external nose is immense, the nasal chambers do not appear to quite correspond in size, but I did not make accurate measurements. The thyroid gland was not demonstrable, although careful search was made for it by Dr. Franklin H. Hooper, of Boston, and myself. Dulness on percussion over the upper portion of the sternum gives some color to the theory that there is a persistent thymus in some of these cases.

The thoracic and pulmonary development is remarkable. The man has an expansion of more than six inches, and the chest-sounds are perfect both on percussion and on auscultation. The heart is apparently proportionate in size to the frame. No lesion was detected.

One feature present that I have not seen mentioned in connection with these cases is a peculiarity of the olecranon and olecranon fossa. The former is comparatively small, the latter apparently much deeper than normal. Hyper-extension of the arm could be readily produced. The photographs show this, and also a

FIG. 3.



similar phenomenon at the knees. (Fig. 3.) The patellae readily slip out of place, and the man has been laid up three times on account of luxation of the patella.

The rough examination that I was able to make detected no lesion of the eye. I did not have an opportunity to have an ophthalmoscopic examination made.

The photographs do not adequately represent the case, but they are, I think, sufficient to verify my descriptions. The case is interesting in demonstrating that akromegaly is not so rare as one might be inclined to imagine. The man is young, and may be expected to develop other symptoms, while the present conditions will probably become more marked.

A CASE OF AKROMEGALY.

BY H. F. HARRIS, M.D.,
OF ATLANTA, GA.

THE patient was first seen by me a short time before death, which occurred as the immediate result of an attack of influenza. At the time of my visit it was impossible to obtain an accurate history of her previous disease, as she was extremely ill, and the distress of the family such that only the following somewhat imperfect details were obtained:

She was a married lady, fifty-three years of age; a native of Georgia. The family history was good. She had five children, all of whom possess a very unusual degree of intelligence, the youngest being now ten years of age. Up to about twenty years ago she had always been in perfect health, but at that time she began to have attacks of neuralgia, sometimes occurring in the head and face, but often also in the limbs; the intervals between the attacks progressively decreased, so that ultimately she was the victim of most agonizing pain, scarcely without cessation, and which successively resisted all the means devised for its relief. This condition continued up to about thirteen years ago, at which time she began gradually to grow better, and, finally, with the exception of an occasionally mild attack, she completely recovered.

Simultaneously, however, with this improvement was first noticed the beginning of those changes in her face and extremities that have since gradually but steadily increased, until they became characteristic. The changes referred to were a slow growth of the bones and cartilages of the face, neck, hands, and feet, an increase of the soft tissues, and probably a thickening of the skin covering these parts. Her mind also became gradually enfeebled, the will-power and memory having perhaps suffered most. Formerly a very vigorous woman, she grew year by year less so; became dull and apathetic; tired easily, and during the last two or three years she has passed by far the greater portion of her time in bed. For six or eight years she had a "goiter" on the right side of her neck. She had been unable to see objects on her left side for about the same length of time.

When I first saw the patient she was suffering with the symptoms of influenza; there were pains in the head, back, and limbs; the respiration and circulation were somewhat increased, and a moderate amount of pyrexia existed; very great general depression was evident.

A chloroform-like odor could be easily detected in the vicinity of the patient. Physical examination failed to reveal any abnormality in either the heart or lungs; no area of dulness could be found in the region of the sternum. Neither hepatic nor splenic dulness extended below the costal margins. A specimen of the urine for examination could not be obtained. The voice was decidedly coarse; the speech was slow, thick, and often hesitating. Though inspiration was easy, there was a decided laryngeal obstruction to the return of the air, expiration being prolonged and accompanied by a loud blowing sound, proceeding from the region mentioned.

Nothing unusual in the proportions of the cranium was observed, except the prominence of the frontal eminences, which, however, were not believed to have

increased in size. The hair was slightly tinged with gray, but appeared well nourished. The ears were not thickened, but stood out prominently from the head, forming almost right angles with it. The eyes were prominent; neither the lids nor the eyelashes presented any abnormalities.

Below the eyes the face was very peculiar. The nose was slightly aquiline, drawn strongly to the right, and enormously increased in size: beginning a short distance below the articulation of the frontal with the nasal bones, the nose began suddenly to expand, and from this point to the extremity it progressively increased in all its dimensions. This increase was due to hypertrophy of the bones, cartilages, and soft parts. The mouth was large, the lips thickened. The skin was of a dirty, faintly-yellowish hue, finely wrinkled over the entire face, and seemed thickened. Although it may have existed to a limited degree, there was no very obvious enlargement of either the malar or superior maxillary bones. The peculiarity about this very strange face, however, that most attracted the attention, was the changed outline, great length and hypertrophy of the inferior maxillary bone; its angle was obliterated to such an extent that the bone formed almost a perfect arc of a circle; its length was out of all proportion to the other dimensions of the face, and caused its alveolus to project far in front of that of the superior maxillary; the width and thickness of the bone were, without doubt, much increased. The tongue almost filled the entire cavity of the mouth, being apparently in width and thickness double its normal size, but little, if any, elongated; the mucous membrane on its dorsal aspect presented numerous deep furrows that crossed each other at short intervals. The teeth were gone. The alveoli, so far as could be ascertained, differed but little from those seen in health under similar circumstances.

The skin of the neck resembled closely that of the face; the deeper soft tissues were hypertrophied. The thyroid gland on the right side was enlarged, forming a tumor of about an inch in diameter; the isthmus and left lobe could not be felt. The thyroid and cricoid cartilages were much enlarged. The hands, and especially the fingers, were greatly altered. The skin here, as over the other affected areas, was wrinkled and seemingly hypertrophied; it was quite loose. The finger-nails were much split longitudinally; they were very short, but somewhat wider than normal. The subcutaneous soft tissues were hypertrophied. The bones—and especially was this true of the phalanges—were greatly increased in width, but were not altered in either of their other dimensions. What has been said of the hands and fingers applies equally to the feet and toes—the changes being identical.

The wrists and ankles were perhaps somewhat broader than normal. The skin for some distance up the forearms and legs seemed thickened. There were no further manifest abnormalities of the limbs.

I was unable to make a thorough examination of the trunk, but, so far as could be seen, no abnormalities were observed, with the exception of a pronounced anterior curvature of the spine in the upper dorsal region, and also a right lateral curvature affecting the dorsal and lower cervical vertebrae.

Notwithstanding the fact that this case presents some

unusual features—among which, as most important, may be mentioned the age at which the onset of the disease occurred and the unquestionable continuance of menstruation—after a careful consideration of the history and symptoms, but little doubt can remain as to the correctness of the diagnosis.

Unfortunately it was impossible to complete the record of the case with the results of a post-mortem.

The following measurements were made after death, which occurred January 6, 1892:

Cephalic extremity.

	Centimeters.
Length from top of forehead to tip of chin	21.9
Extreme width of face	12.7
From meatus auditorius to edge of the nasal orifice	right, 12.1 left, 11.4
From meatus auditorius to the center of the nasal bones between eyes	right, 14.8 left, 15.3
Breadth of nasal bones between canthi	1.0
Breadth of nasal bones at bridge	1.6
Extreme width of the alæ nasi	2.7
Length of nose	7.6
From tip of nose to lip	3.5
Thickness of lips	2.2
From the nose to edge of upper lip at mouth	1.8
From edge of lower lip at the mouth to the chin	4.8
Width of mouth	7.0
Length of inferior maxillæ from angle to symphysis	right, 10.2 left, 10.5
Length of each ear	6.8
Circumference of neck at hyoid bone	34.0
Extreme width of thyroid cartilage	5.4

Trunk.

	Centimeters.
Length of clavicles	17.9
Breadth of clavicle at sternum	right, 2.0 left, 2.4

Superior extremities.

	Centimeters.
Length of arms	right, 35.2 left, 35.3
Circumference of arms at middle of biceps	22.6
Length of each radius is	24.0
Greatest circumference of forearms	24.0
Circumference of wrists	17.8
Length of hands from the carpo-metacarpal articulation to end of middle fingers, each	17.2
Circumference of metacarpal bones at thumb	22.1
Circumference of hand, without the thumb, at head of the metacarpal bones	21.8
Length of middle fingers, dorsal surface	10.8
Length of ring finger, dorsal aspect	10.5
Length of little fingers, dorsal aspect	8.9
Circumferences—	
thumb, first phalanx	right, 7.0 left, 7.0
" second phalanx	right, 7.3 left, 7.3
index finger, first phalanx	right, 7.3 left, 7.0
" second phalanx	right, 6.3 left, 5.9
" third phalanx	right, 5.6 left, 5.3
middle finger, first phalanx	right, 7.3 left, 7.0
" second phalanx	right, 6.4 left, 5.9
" third phalanx	right, 5.9 left, 5.3
Greatest thickness of hand	3.7

Length of nails, thumbs	0.9
Width of nails, thumbs	1.5
Length of nails, middle fingers	0.9
Width of nails, middle fingers	1.2
Length of nails, little fingers	0.5
Width of nails, little fingers	1.0

Inferior extremities.

	Centimeters.
Length of thighs	47.2
Circumference of thighs	45.8
Diameter of patella, vertical	6.6
Diameter of patella, transverse	7.5
Length of legs	40.8
Circumference of knees	36.1
Circumference of legs at middle of calf	29.6
Circumference above internal malleolus	21.6
Greatest circumference of foot	25.6
Greatest width of foot	9.5
Length of plantar surface of foot	21.0
Length of great toes, dorsal surface	6.3
Length of second toe, dorsal aspect	5.6
Length of little toe, dorsal aspect	5.0
Length of nails, great toe	0.9
Width of nails, great toe	1.8
Length of nails, second toe	0.3
Width of nails, second toe	1.2

MEDICAL PROGRESS.

A New Method of Circular Enterorrhaphy.—As the result of experiments upon dogs carried on during a period of a year and a half, HARRIS (*Chicago Medical Recorder*, vol. iii, No. 7, p. 523) proposes the following method of circular or end-to-end enterorrhaphy. A loop of bowel is drawn out of as small an opening as possible and protected by sterilized gauze, while its direction is determined by placing it in the longitudinal axis of the body, with the mesentery made tense. The fingers are then passed down on one side; if they enter the corresponding side of the abdomen, the relations of the bowel are normal; if the fingers enter the opposite side of the abdomen, the mesentery is twisted and the relations of the bowel are reversed. The loop is gently stripped of its contents and light elastic or gauze ligatures applied at two points, between which the bowel is divided transversely, the mesentery being preserved close up to the edge. The distal portion of the bowel is denuded of its mucous membrane for a distance of from a half to three-quarters of an inch by scraping with a sharp curette. Now the proximal portion of the bowel is invaginated into the distal portion. A needle threaded with silk is made to transfix the thickness of the lower or denuded portion of the bowel just to one side of the mesentery, and at the internal limit of the denudation. The needle is not drawn entirely through the wall of the intestine, but only until the point projects from the caliber of the bowel a little beyond its free edge. The point of the needle is made to pick up a bit of the other portion of the bowel, transversely, just to one side of the mesentery and close to its edge. By drawing the needle back a little and using it as lever, by turning it around its point of transfixion in the lower portion, the upper portion on this side will be invaginated into the lower portion for the extent of the denuded surface. The point of the needle is then pushed on through the lower portion from within outward a short distance in a line

transversely from its point of entrance, where the needle is left temporarily, transfixing the bowel and holding that part of the upper portion invaginated. The same process is repeated with a second needle at a corresponding point of the bowel on the opposite side of the mesentery, while a third needle is used similarly at the part of the bowel opposite to the mesenteric attachment. In case the caliber of the bowel is very large, as, for instance, in the colon, more than three needles may be used. The needles may now be successively drawn through and the sutures tied, thereby permanently fixing the invaginated extremity to the internal limit of the denudation, or if the bowel is large and rather flabby, the needles may be allowed to remain in until all the suturing has been done, so as to give firmness and stability to the parts by keeping the bowel dilated, thus facilitating the rapidity of suturing. The exposed portion of the bowel is attached all around to the invaginated part by an interrupted suture taken transversely, care being taken not to penetrate the lumen of the bowel. Two or three sutures are then taken on either side of the mesentery, when the operation is completed and the loop returned. There will be two rows of sutures around the bowel, one at either extremity of the divided bowel, thus permanently keeping the apposed surfaces in accurate approximation, independently of the varying caliber of the bowel. While it is perhaps more desirable to invaginate the upper into the lower portion of the bowel there is no absolute necessity for doing so.

Twenty-five Cases of Extirpation of the Uterus for Carcinoma.—At the recent meeting of the American Association of Obstetricians and Gynecologists, Dr. Charles A. L. Reed, of Cincinnati, presented a report of twenty-five cases of complete vaginal extirpation of the uterus for carcinoma with only two primary deaths—one from shock and one from iodoform-poisoning. Of the twenty-five operated upon, but fourteen were of more than two years' standing, and hence were all that could be discussed with reference to their ultimate results. These fourteen were divisible into two classes of seven each, viz., those in which the disease had existed for more than six months, and those in which it had existed for less than six months before the operation. Of the first class, all were dead; of the second class only one had died. One of the recoveries was of more than five years' duration. The conclusion from these figures is that cases of carcinoma of the uterus ought to be remanded for operation as soon as diagnosed. Dr. Reed considers total extirpation as the only operation to be advised or practised in these cases, the primary mortality from which, in experienced hands, varies from 5 to 8 per cent.

THERAPEUTIC NOTES.

The Treatment of Malignant Neoplasms.—SPRONK (*Allg. Med. Central. Zeitung*, No. 65) has treated eight cases of sarcoma and seventeen cases of carcinoma by means of injections of from a minim and a half to fifteen minims of sterilized cultures of streptococci. The injections were made at points remote from the new-growth, and preferably in the gluteal region. Often as early as

two or three hours after the injection there was complaint of sharp pain, particularly in the primary tumor, disappearing in the course of twenty-four hours. The neoplasms became more sensitive to pressure, redder and warmer, and at the same time somewhat swollen. An injection of a definite amount was invariably followed by fever; the temperature began to rise four or five hours after the injection, and there was complaint of languor, headache, and malaise; the temperature never rose above 103.1°, and, even after large doses, returned to the normal in the course of twelve hours. A tolerance to the remedy was acquired, for, after a certain time, both local and general reaction failed to appear. The subcutaneous tissues in the situation of the injections at first became red and swollen, but subsequently presented no reaction. The results of the treatment were variable. In most cases the tumors continued to grow, although the rapidity of growth was often less than it had been. At times there was a cessation of growth. Some of the tumors diminished in size. Some disappeared, but recurred. In no case did total absorption take place. In spite of the continuance of treatment the tumors again began to grow, creating an impression that the tissue of the neoplasm had become tolerant of the injected substances. Better results were obtained in the cases of sarcoma than in those of carcinoma.—*Wiener med. Presse*, 1892, No. 39, p. 1555.

For Rheumatic Iritis.—DEHENNE (*L'Union Méd.*, No. 107, p. 383) recommends that about every hour hot water be applied to the eyes for five minutes by means of absorbent cotton. Ten grains of sodium salicylate should be given three times a day; or, four grains of quinine sulphate three times a day; or,

R.—Alcohol ℥xx.
Tinct. colchici ℥xl.
Syrupi simplicis f 3ij.
Aque destillat. f 3j.—M.

S.—A tablespoonful, or two tablespoonfuls, at bedtime. If the inflammation is active, and sleeplessness is present, several leeches may be applied to each temple, or a subcutaneous injection of morphine hydrochlorate may be given.

Inhalant in Whooping-cough.—

R.—Thymol gr. xxv.
Ether f 3jss.
Essence of sassafras }
Essence of eucalyptus } āā f 3ij.
Essence of turpentine }
Liquid tar }
Carbolic acid f 3vss.
Alcohol, sufficient to make . f 3j.—M.

S.—Gtt. xxx every two or three hours on a handkerchief about the child's throat.

BEALL, *L'Union Méd.*, 1892, No. 109.

Antidote for Hydrocyanic Acid.—ROBERT has shown experimentally that hydrogen dioxide, given by the mouth or subcutaneously, is an effectual antidote in poisoning by hydrocyanic acid.—*Provincial Medical Journal*, vol. xi, No. 130.

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SATURDAY, NOVEMBER 5, 1892.

CLEANLINESS THE BEST PREVENTIVE OF CHOLERA.

For the present the popular excitement concerning cholera has subsided. It is hoped, however, that permanent good results may be its legacy. The establishment of a uniform system of National quarantine under National direction, and the improvement of local quarantine-stations, is almost certain to be among them. There is another subject, however, of greater importance than quarantine. The student of epidemiology cannot overlook the experiment conducted for half a century on the greatest possible scale in Great Britain. With detention only of infected ships, persons, and goods, without the harsh and unnecessary quarantining of healthy persons and of ships so long at sea that the period of danger had long since passed (which in our frenzy has recently been practised at American ports), England has escaped the disease, despite her constant communication with India, where cholera is almost continuously endemic. In the admirable paper read before the Philadelphia County Medical Society by DR. BENJAMIN LEE (MEDICAL NEWS, September 17, 1892, p. 322), the reasons for this immunity have been forcibly set forth. English authorities insist upon domestic cleanliness. The rigid system of sanitary inspection, the improved

and improving sanitary methods, the power vested in the Boards of Health and the means placed at their disposal, in Great Britain, enable clean streets, clean water, and clean houses to be interposed as a far more effective barrier against the invasion of disease than the most rigid quarantine can possibly be; and without the disturbance of commerce and personal hardship of travellers inherent in the quarantine system. Not that the domestic sanitation of Great Britain is perfect. If it were, typhoid fever would be unknown on the island; while as it is, the rate of mortality from typhoid fever in London is not far from one-fourth as great as the rate of mortality from the same disease in Philadelphia. Yet with all the admitted imperfections the sanitary system of Great Britain has repeatedly proved its efficiency against the importation of cholera into ports whose commerce in a week equals that of Philadelphia in a year.

Another significant fact is the remarkable result of the researches into the source whence cholera was imported into Hamburg. The natural supposition was that cholera having appeared in Russia, the large number of Jews expelled from that country had been, in their forced migrations through Europe, the carriers of the contagion. This appeared even more probable when it was considered that most of these people had been so maltreated that they had become reduced to a state of pitiable destitution, and were likely to become easy victims of pestilence. Contrary to expectation, however, careful investigation shows that apart from a few cases evidently contracted at the port of Hamburg, the Russian emigrants were "free even from the suspicion of the disease." (*Deutsche medicin. Wochenschr.*, No. 36, 1892). Still more remarkable is the fact that in Russia itself, notwithstanding the rigorous enforcement of the inhuman "May laws," by which Jews were expelled from their homes in the cities, towns, and villages outside of a certain limited district termed the "Jewish Pale," and from towns and villages even within the Pale, and crowded into certain already over-congested districts in the cities of the Pale, and this amid the horrors, moral and physical, so graphically depicted by HAROLD FREDERIC—still more remarkable is the fact that, despite all this, the Pale has been practically exempt from cholera; as an esteemed cotemporary puts it, "like a new land of Goshen in the blackness of the modern Egypt."

As neither the plagues of the "modern Egypt,"

nor the exemption therefrom of the modern Hebrews can be ascribed to miracle, and as religious belief, *per se*, can have no prophylactic virtue against disease, the cause of the immunity from cholera of the Russian Jews must be sought in customs dependent upon their belief. These are readily found in the Biblical and Talmudic laws of cleanliness. It is true that these laws merely prescribe practices observed by cleanly persons of all faiths and of no faith; but the fact remains that the vast majority of the inhabitants, even of civilized countries, are not cleanly, and in Russia cleanly persons form a very small minority. The Russian Jew would probably be as uncleanly as his neighbors did not the ritual of his religion compel him to be otherwise. The testimony of all impartial observers, however, agrees that he is cleanly, under circumstances not conducive to cleanliness. As most of the refugees have been compelled to travel long distances in large companies, often without shelter, and scantily provided with food and clothing, and facilities for complete cleanliness of person, the ritual factors of their immunity have probably been reduced to three: (1) Washing the hands after urination and defecation; (2) washing the hands before eating; (3) dietary restrictions and methods of preparation of food. Within the Pale, certain bathings of the entire person at prescribed times, occasional and periodic, and certain periodic house-cleansings have doubtless been additional protective influences, just as in the Middle Ages these practices preserved the Ghettoes from the invasion of the plague, despite the fact that the streets in the Jewish quarters of European cities were in an equally filthy condition with all other streets. But whether or not this explanation be correct, the facts are as stated, and they certainly challenge attention. The subject is worthy of accurate and detailed investigation by students of hygiene.

THE CHOLERA AT HAMBURG.

THE therapeutic lessons of the recent epidemic of cholera that has played such sad havoc in the city of Hamburg are not very assuring. In spite of modern methods of treatment and in the face of an enlightened hygiene, the mortality of the disease has been about 43 per cent.—a figure that does not reflect much credit upon our therapeutic resources, and not likely to inspire much confidence in them.

Basing his observations upon about three thousand cases, RUMPF (*Deutsche medicin. Wochenschr.*, No.

39, 1892, p. 877) makes a preliminary report upon the results of the various modes of treatment employed in the New General Hospital of Hamburg during the epidemic. The cases are considered in four divisions: Those of simple diarrhea; those in which intoxication has become manifest; cases in the algid stage; and cases presenting secondary conditions, of which the most important are septic fever and a tendency to coma, with nephritis.

When symptoms of intoxication are present the indication is to expel the offending organisms from the intestinal canal or to insure their destruction by chemical means. To accomplish the latter end a large number of remedies have been proposed. Largely on theoretic grounds salol has been recommended as a specific. The drug was faithfully used, but the results were most disappointing, as it proved entirely useless. There was the same experience with creolin. Creasote could not be taken in at all considerable doses, as, until rejected by vomiting, it served only to increase the sense of burning in the upper portion of the alimentary canal. Hydrochloric acid, lactic acid, the cresols, and chlorine water were also employed, but failed to exert any beneficial influence.

An extensive trial was early made of injections of tannic acid into the bowel, but the method had soon to be abandoned as futile. To explain the failure of these various agents to accomplish the purpose for which they were employed, it is suggested that not only has sufficient absorption taken place to occasion the phenomena of intoxication, but that the poisonous products of dead bacilli may be taken up through the injured mucous membrane. Subcutaneous injections of salol in ether and of morphine in sulphuric acid were also practised, but without success.

For the purpose of expelling the noxious matters from the intestinal canal and at the same time of disinfecting the contents of the bowel, calomel was used in a large number of cases, and preferably in those with simple diarrhea or in the first stage of intoxication, and with increasingly favorable results.¹ The drug was at first given in daily doses of four and a half grains, but subsequently, to adults, in doses of from a third to three-quarters of a grain every two hours. Under this treatment the vomiting and diarrhea were often favorably influenced;

¹ The utility of calomel in the early stages of cholera is confirmed by the results of its employment in India and recently in Russia.

if necessary, a thirtieth of a grain of cocaine in water was additionally given for the vomiting.

Next in usefulness to calomel was the hot bath, repeated as often as the temperature sank low. The direct results of the bath were seen in the deepening of the respiration and the filling of the pulse. In conjunction with the baths, hot tea and coffee and wine and champagne and injections of oil of camphor were given. The substitution of hot-air and steam baths for baths of hot water was not found advantageous. For the pain in the epigastrium and the cramp-like pain in the arms and legs morphine was given subcutaneously in small doses.

This plan of treatment, by means of calomel and hot baths, was carried out for three days, with results that were quite satisfactory; when it was supplemented by general measures, including opium, tannic acid, bismuth, and silver. The treatment of cases that had reached the algid stage was attended with results far less favorable. Many agents were used, among them hot-air and steam baths and inhalations of amyl nitrite, but all in vain. Only injections of morphine and camphor were persisted in. Subcutaneous infusion of a physiologic (0.6 per cent.) solution of sodium chloride fulfilled a certain useful end, but the best results were obtained from the intra-venous injection of large quantities (two pints) of the same solution at a temperature of 107.6°. Soon after, or even during the progress of such an injection into a vein, the pulse would improve, the respiration deepen, the somnolence disappear, and the color return to the surface. The result was, however, not always persistent, and it often became necessary to repeat the injection, perhaps once, perhaps twice, perhaps oftener; nor was the outcome always favorable.

Recovery took place in perhaps 25 per cent. of the cases thus treated at this stage. The good accomplished seemed to be due principally to the heat provided, and the dilution of the toxic matters in the system, and in an insignificant degree to the prevention of the thickening of the blood. In some cases medicinal agents were added to the fluid injected.

The conclusion is reached that there is as yet no specific treatment for cholera, but the hope is expressed that modern bacteriology may be the means of leading to the discovery of an agent that will destroy the poison of the disease without endangering the integrity of the organism.

COW'S MILK.

THE milk-supply of a community is a subject that cannot be too freely discussed, and of which the importance cannot be exaggerated, and the Medical Society of New Jersey deserves warm commendation for an inquiry instituted in this connection, the results of which are embraced in a report which has just been issued by a committee appointed for the purpose.

Milk is so universal and so essential an article of food that no means should be spared to insure and maintain its purity. Next to water it is one of the most common carriers of contagion. Countless are the epidemics of disease that owe their origin to infection transmitted by milk, and beyond calculation the resultant mortality. Further argument is not needed for the necessity of the purity of the milk-supply.

It goes without saying that milk must be obtained from healthy animals, that it must be free from adulteration, and free from contamination. It is not only necessary that the milk be unadulterated and free from decomposition, free from the presence of pathogenic organisms, and other noxious matters, but it should also conform to a definite qualitative and quantitative standard. It must not only have a definite specific gravity, but there should be a proper adjustment of its nutrient ingredients, of fat, of albumin, of salts.

It is to be feared that the desired result is not to be obtained from the spontaneous and volitional action of the dairyman, but it is essential to have his coöperation in the matter. No dairyman can produce good milk if he fail to supply his cows with proper and sufficient food, and fail to provide them with adequate and hygienic accommodations. If the present price of milk is insufficient to secure such ends (and we have no reason to believe that it is insufficient), the price must be raised.

After the insurance of a supply of milk of proper quality, it is important that the purity be maintained until the article is handed over to the consumer. This means scrupulous and intelligent care and cleanliness in all the details that enter into the processes to which the milk is subjected from the moment that it is obtained from the cow until it is delivered. It implies rigid cleanliness on the part of the milker, the greatest care as to the receptacles, the storage at a low temperature immediately after milking, and the prompt transportation and delivery. It then becomes the duty of the

consumer to take such precautions as boiling and to continue the application of the same principles as have governed the dairyman up to this point.

To attain the ends here outlined vigorous means are required. It is absolutely essential that the processes of the dairyman be subject to rigid scrutiny from beginning to end. It is not implied that dairymen are at all less to be trusted than other persons, but discipline can only be maintained by a thorough enforcement of methods of inspection and punishment for delinquents. This work of inspection can only be done by experts familiar with and versed in modern chemic and bacteriologic methods. The responsibility for providing such a board of officers belongs to the State, for it can have no higher duty than the protection of the health and the preservation of the lives of its citizens.

It is time that the reform in this direction should take practical shape. Existing legislation should be enforced, and if deficient, new measures should be formulated and put into speedy and efficient execution. With the knowledge that enteric fever, cholera, scarlatina, probably diphtheria and other fatal diseases are transmissible by milk, it were criminal to be indifferent or dilatory.

SOCIETY PROCEEDINGS.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

Stated Meeting, October 12, 1892.

THE PRESIDENT, DR. JOHN B. ROBERTS, IN THE CHAIR.

DR. BARTON COOKE HIRST read a paper entitled "Symphysiotomy, with the Report of an Operation." (See THE MEDICAL NEWS, October 15, 1892, p. 431.)

DR. ANNA M. FULLERTON reported the performance of a similar operation on October 7th at the Woman's Hospital, by Dr. Anna E. Broomall.

The case was that of a colored woman, about thirty years of age, four feet eight inches in height, with a rachitic, generally contracted pelvis, the measurements of which were as follows: External conjugate, 19 cm.; spines of ilium, 23 cm.; crests of ilium, 24 cm.; diagonal conjugate, 10 cm.; true conjugate, 8½ cm.

The pelvis representing the second degree of contraction, it was not surprising that the woman's childbearing record should be that of successively increasing difficulty with each delivery. She had borne six children, and had lost two of them through complications in the labors. In the labor preceding the one under consideration the breech had presented, and the child was lost during the birth.

In the present instance, the patient being near the close of full term, the membranes ruptured prematurely when there was little or no dilatation. Pains set in shortly after, and the patient continued in active labor

for twenty-four hours. At the end of this time it was found that there was no attempt at fixation of the presenting part—the head—which still rested above the inlet, and whose size seemed quite disproportionate to that of the superior strait. The uterine os being quite dilatable at this time, and the fetal heart indicating that the child was suffering from the long continuance of the labor, the mother also showing signs of exhaustion (pulse 120, temperature 99°), it was decided to perform symphysiotomy.

Dr. Robert P. Harris, who had seen the patient previously to the onset of labor, and who had predicted the possible necessity of her requiring such an operation, was present, as were several members of the hospital staff. After the usual antiseptic precautions, the operation was performed by means of Galbiati's sickle-shaped bistoury as described by Dr. Hirst, and the child was delivered by the application of forceps. There was little difficulty in the extraction after the separation of the symphysis. The child breathed as soon as delivered, and still continues to do well. The head measurements were as follows: O. F., 12 cm.; O. M., 13½ cm.; biparietal, 9½ cm.; bi-temporal, 8½ cm.

It was appreciated at the time of extraction that there was a separation of three or four centimeters at the pubic symphysis. Upon extending the limbs preparatory to the closure of the wound and the application of antiseptic dressings, this space was reduced to one and one-half centimeters. A firm bandage was applied for fixation of the pelvic bones. Both mother and child, up to the present time, have continued to do well. The highest temperature of the mother was 99.6° F., and this but for a few hours, the temperature remaining normal for the greater part of the time. The pulse, which was 120 before labor, soon fell to 78 or 80.

Attention was called to the great difficulty in carrying out antiseptic precautions during the puerperium. The necessary fixation of the pelvis and lower limbs prevents the frequent and thorough cleansing of the vulva and the careful removal of all discharges, and interferes with the normal performance of the functions of micturition and defecation, without risk to the union of the symphysis. Some method would seem to need to be devised to obviate this complication.

DR. E. P. BERNARDY stated that the history of symphysiotomy dated back over a hundred years. At that time France and Germany gave it a fair trial; not fulfilling the object of its discoverer, Dr. Sigault, it died a natural death. In England the operation was opposed by all the then prominent medical men. Only one case was operated on, and it was the last, as the woman died.

Churchill, the most famous medical statistician the profession has ever known, reports as follows: In 49 cases 16 mothers died, or about one in three; and of 40 cases the child was born alive in 21, and died in 19.

M. Figueira gives a list of 157 cases, of which 72 mothers died.

Morisani, of Naples, read a paper on this subject in 1881, reporting that the operation had been performed in Naples fifty times, twice on the same woman. Forty women were saved, and ten died (20 per cent.). Forty-one infants were saved, and nine died (18 per cent.).

Kilian, in 68 cases, reports a maternal mortality of 32 per cent., and a fetal one of 63 per cent.

In 45 instances the vertex presented, with 4 deaths; in 3 the pelvic extremity, with 3 deaths; in 2 the trunk, with 2 deaths.

The statistics of embryotomy, symphysiotomy, and Cesarean section were compared.

Embryotomy. Tibone gives a maternal mortality of 21 per cent. Chiara gives a maternal mortality of 24 per cent.

Symphysiotomy. Morisani, the father of the operation, in 1881, in Italy, gives us 1 mother lost in every 3, and 1 child in every 2.

Cesarean section gives us 1 mother lost in every 2½ at the present era. The operation, as now performed, is attended with hardly any maternal loss. Two-thirds of the children are saved.

What is the object of the operation? To increase the diameter of the pelvis, thereby saving the child and preventing the operation of embryotomy or of Cesarean section.

The head presents in the oblique diameter at the superior strait, and the actual diameter that prevents the descent of the presenting part is the short or conjugate diameter. Does the section increase this diameter? If there is a separation of half an inch, about two lines are supposed to be gained; if there is a separation of an inch, about four lines are obtained. Sigault himself states that half an inch was the greatest separation that could be obtained without danger.

Undoubtedly the transverse and oblique diameters are the gainers through the section, but the actual diameter that is at fault is the one benefited the least.

To what extent can separation of the symphysis pubis take place without injuring the sacro-iliac synchondrosis? It is claimed that a separation of half an inch at the symphysis will give two inches of separation at the sacro-iliac synchondrosis. One inch at the pubis gives three inches at the iliac articulation, certainly a stretching that means danger and rupture, and any stretching much beyond this point may be followed by irretrievable injury to the maternal tissues.

The operation is not devoid of danger. Sigault, while he saved the life of his first patient, left her with injuries of the bladder and urethra of such a nature that she was unable ever afterward to retain her water. Incontinence of urine, prolapsus uteri, exfoliation of the bones of the pelvis, and gangrene of the parts have been known to have occurred. While, as a general rule, the separation of the symphysis pubis readily heals, still Cazeaux states that perfect union only takes place in from one to three months.

The operation is limited in its range. Sigault himself gave the limit at from three to two and a half inches, himself recommending the Cesarean operation in any case outside of this limit.

Symphysiotomy, as described by Dr. Hirst, is an apparently simple operation, and its very simplicity will be the cause of its abuse. Two of the cases operated on by Sigault were afterward delivered naturally. In a case of Le Roi's, the patient was delivered naturally twice afterward. Leblanc's case was afterward confined in a normal labor. Vandamen's patient had been delivered of children previously to the operation, leaving certainly a doubt in one's mind of the necessity for the operation. It is difficult to believe that if a woman has given birth

to six children, there will arise in the seventh confinement the necessity of performing this operation.

It has been done, and history repeats itself.

In presenting these statistics and remarks, Dr. Bernardy did not wish to oppose the operation, but he believed it to be his duty to adopt any substitute for that of the fearful operation of embryotomy or the one of Cesarean section, and to give warning that this apparently simple operation, symphysiotomy, is not devoid of danger, and may be followed by serious results to both mother and child, and that obstetricians should be careful not to sanction its use until all the pros and cons have been fully understood and discussed.

DR. WILLIAM EASTERLY ASHTON touched upon two points in reference to the operation of symphysiotomy: First, in regard to Dr. Fullerton's remarks as to the impossibility of carrying out proper antiseptic care of the patient during the puerperal period; and second, in reference to the statistics quoted by Dr. Bernardy.

It is now well shown by the results of obstetric work done in Germany that the mortality following labor is less when vaginal irrigation is not used after the delivery of the child. It is, therefore, an easy matter, if vaginal injections are not employed, to keep the external organs clean without disturbing the pubic joint.

Dr. Bernardy's statistics would be invaluable if it were not for the fact that they refer to operations done before the days of antiseptic surgery. The statistics of the past teach nothing in this connection. Only the results obtained since asepsis became the keynote of all surgeons can be considered. The dangers of necrosis, of delayed union, and of cystitis are all the results of septic infection, and cannot be considered as possible consequences of a symphysiotomy done under modern methods. The cases collected by Dr. Harris were all operated on since 1886, and the brilliant results obtained must stand as evidence of what can be accomplished to-day.

Symphysiotomy is an advance in obstetric surgery, and its introduction into this country is due to the painstaking and laborious work of Dr. Robert P. Harris. The question under discussion is an important one, because, if what is claimed for symphysiotomy be true, embryotomy upon the living child will never be indicated—and Cesarean section will have a positive, but never a relative indication. Dr. Ashton expressed the belief that the obstetrician's first duty is to the mother, and that if it is a question between section and embryotomy, the latter operation is to be advised. The dangers of hernia, of bowel-adhesions, and of sinus-tracts are too real to look upon Cesarean section as a simple matter. Far better is it to destroy the child's life than endanger the future health and usefulness of the mother. The profession will hail with delight an operation that at once does away with the relative indications for Cesarean section and at the same time relegates embryotomy into oblivion.

DR. CHARLES P. NOBLE stated that the only matter to settle is whether or not there is a good working pelvis—one that a working woman can use. Then, unquestionably, symphysiotomy will replace Cesarean section done for the relative indication. But the most pleasing result of the revival of the operation is that it will take away from those who have no hesitation in destroying

the fetal life the excuse for so doing. Dr. Noble added that, personally, the idea of destroying the fetal life has been so repugnant that, with the improved results that have been obtained with modern Cesarean section, he had already determined that he would not destroy a living, viable child. One has no right to destroy the fetus when, with slightly increased risk to the mother, both may be saved. The risks of symphysiotomy are probably less than those of Cesarean section, especially in the hands of the average physician, and the risk of the elective Cesarean section is extremely slight. There is no reason why such a case should die except from accidents that are liable to happen in all things human. Even when the operation is not done under the best of circumstances the mortality is very slight in the hands of good operators. In the last thirty-eight cases operated on in Leipsic by eight operators, there were only two deaths. Cesarean section cannot be considered very dangerous, but at the same time there is no doubt that it is more formidable than symphysiotomy, and if the latter operation will result in a living baby and a sound pelvis, it is to be preferred to Cesarean section, except in cases of marked pelvic deformity (less than two and three-quarter inches in the conjugate), and in cases of bony or fibroid tumors.

Another way in which symphysiotomy will do good is that the public will not be so afraid of it. In many cases it will be possible to do symphysiotomy when consent to Cesarean section could not be secured.

Symphysiotomy will also be of service in covering up the careless obstetrics of Americans. As a rule women are allowed to go into labor without anything being known about the condition of the pelvis, without a knowledge whether or not there is any disproportion between the size of the head and that of the pelvis, which is only discovered if the child fails to come down in the natural way. With symphysiotomy the lives of many of these neglected women may be saved, which would be lost by Cesarean section done at the eleventh hour.

DR. ROBERT P. HARRIS stated that he had studied the cases of symphysiotomy from its beginning, in 1777, down to October 8, 1892. It is only since the beginning of 1886 that the operation has secured the position that it should naturally occupy. Late in 1885 there was a case lost. There has been but one death since, but that had no connection with the operation. The woman had been in labor several days, the right shoulder of the fetus presented, and the cord was prolapsed and beating feebly. The symphysis pubis was opened and the child turned and delivered in a deeply asphyxiated condition. The woman died twelve days later with metro-peritonitis, the result of manipulations practised before she was brought to the hospital in which the operation was performed. From January 1, 1886, to October 8, 1892, there were fifty-two operations with one death. Seven children were lost. Only one was born dead. Three were born in an asphyxiated condition, and the rest died during the first three days. If the child does not survive beyond the first three days, it was counted as lost. Out of fifty-two children forty-five lived. Fifty-one were born alive.

Among the men who have taken up the operation are Professors Charpentier and Pinard, of Paris, the second of whom has operated eight times in seven months;

Prof. Leopold, of Dresden, who has operated twice; Prof. W. A. Freund, of Strassburg, who has operated once, and Dr. Charles Porak, of Paris, who has operated twice. Porak's first case will teach a good lesson. The woman had a pretty fair-sized pelvis, but the fetus was too large to pass through. He put on the forceps and made all the attempts that he thought proper, but failed to deliver the child. He did not think that it was a case for Cesarean section. The woman had been in labor some hours. He opened the symphysis, put on the forceps a second time, and accomplished the delivery without any trouble. The woman recovered and the child lived.

DR. DEFOREST WILLARD asked, What would be the objection to a subcutaneous operation? Would it not be as useful, and would it not avoid the dangers alluded to? It could be done with almost perfect safety.

DR. HIRST stated that he did not see that any advantage would be gained by subcutaneous operation. In all of the recent cases there has been primary union of the symphysis and of the wound. In the case reported the stitches were removed on the fifth day, and union was complete. At the end of a week the symphysis was tested by alternate pressure on the iliac bones, but no motion could be felt. By subcutaneous section the urethra and neighboring vessels could not be protected. By first sliding the finger down close to the bone and passing the knife along its palmar surface there is no danger of wounding the urethra or vessels. Injury to the vessels occurred in one of Leopold's cases, and necessitated the temporary suspension of the operation. The subsequent course of the case is as good with the open wound as it would be were the section subcutaneous.

DR. EDWARD JACKSON read a paper entitled "Foreign Bodies in the Cornea." The history given by the patient, as to a foreign body in the cornea, is often worthless. If the foreign body is but partly imbedded, and the projecting portion is hard and angular, so that every movement of the lid causes a scratching of the conjunctiva lining it, the patient, of course, immediately notices its presence, and can give a correct and definite history of its occurrence; but if the foreign body be deeply imbedded, so that it does not touch the conjunctiva of the lid, or if it lie with a perfectly smooth surface presenting to the lid, its entrance may not be noticed, or the momentary disturbance caused by it may be so slight as to be forgotten before the secondary effects of its presence draw attention to the eye, and even if those secondary effects are ascribed to it, and the foreign body itself be perceived, it may be supposed to have entered the eye at a time considerably later than was the case. Often, however, the patient will, on account of the gradual advent of the symptoms of irritation, ascribe them to an entirely different cause.

Again, very many patients come with the impression that a foreign body is in the eye, from the irritation—the sensation of scratching—caused by a simple conjunctivitis. Having thought the matter over carefully and repeatedly, they can usually tell just when and how the mythical foreign body was lodged there. They even go so far as to accurately locate it, by picking out some spot on the iris not before noticed, and regarding it as the offending object.

For the diagnosis of a foreign body in the cornea one must depend on what generally is the sufficient basis for a diagnosis in diseases of the eye—the results of examination of the patient. If the foreign body is comparatively large, the most casual glance may reveal its presence, but often there is need for special methods and a prolonged search before its presence or absence is established; and even when its presence is perfectly obvious at the first glance these same methods must often be employed to make sure that we have completed its removal.

In the search for the foreign body the important idea with reference to the illumination of the eye is that it shall be thoroughly under the control of the surgeon, so that he may either strongly illuminate the cornea itself and view it against a dark background of unilluminated iris and pupil, or he may illuminate the background, leaving the cornea in comparative darkness, and depending on the interruption of the light from the background that any opaque foreign body will cause, to reveal its location. This is the advantage that the so-called "oblique" or "focal" illumination in the dark room possesses over inspection by ordinary diffused light.

The shifting of the point of view, so as to bring the foreign body into the area of most favorable illumination, is essential to any thorough search, whatever method is employed. By focal illumination foreign bodies of light color will be best seen when strongly illuminated against the black pupil as a background; while if the foreign body is dark it is better to strongly illuminate the iris behind it.

One may also get an illuminated background, against which a foreign body will usually appear as a black speck, by throwing the light into the eye with the ophthalmoscope mirror held several inches in front of it, and shifting the position of the eye or the point from which it is viewed so as to obtain the fundus reflex through the different parts of the cornea.

An excellent method of searching for the foreign body, and one that has the advantage of being available during its removal, is to look for the interruption that it causes in the reflex obtained from the corneal surface. To do this, the patient should be made to face a window with a large open sky-space, while the surgeon takes his position so as to obtain the reflection of the sky-space from the surface of the cornea, a very good position being to stand behind the patient, looking down on the cornea. The patient's eye is then turned from point to point, so that the reflection is obtained from all parts of the cornea in succession. If the window with clear sky-space is not obtainable, a piece of plain white paper or cardboard strongly illuminated, and held close in front of the eye to be examined, will furnish the required reflex from the corneal surface. The essentials are that the reflex shall be bright, uniform, and large enough to enable the observer to go rapidly over the whole cornea without missing any part of it.

If on any part of the surface there is an irregularity, as an ulcer or a foreign body, this will cause an interruption of the reflex, and be immediately noticeable. A great help in making such irregularities prominent is the careful drying of the cornea with a little absorbent cotton, a method to the full value of which attention has been

called by Dr. M. W. Zimmerman. The removal of all moisture does not impair the reflex from the sound cornea, but lays bare any irregularity or loss of substance, which, when filled with fluid, would give almost the normal corneal reflex.

Another aid to the detection of foreign bodies in the cornea is the use of a solution of fluorescein. A good solution consists of

Fluorescein	1 grain.
Sodium carbonate	2 grains.
Distilled water	1 fluidram.

A single drop of this is placed on the suspected cornea, and after two or three minutes the excess is allowed to be washed away by the tears. It is then found that while on the uninjured cornea not the slightest effect has been produced, the corneal tissue in the neighborhood of any recent abrasion has been stained a noticeable light-green. This discoloration at once directs attention to the locality of the injury, and the stained tissue furnishes a background against which any foreign body of dark color is more readily seen.

While the reception of a foreign body in the cornea may not be noticed, and during the first few hours the pain and redness resulting from its presence are likely to be quite slight, its continued presence provokes a reaction that increases in severity, until it is gotten rid of. At first the redness will be confined to the vessels of the part of the pericorneal zone nearest the foreign body, and its location will then often guide us to the site of lodgment. Later, it extends until the whole conjunctiva and the deeper tissues of the globe become hyperemic, when it becomes of little diagnostic value. With the increased vascularity come increased pain and tenderness.

Self-cure, in the case of a foreign body in the cornea, takes place by suppuration of the adjoining tissue to such an extent that the softening loosens the foreign body and allows it to be rubbed off by the movements of the lids—a slow, painful process, that probably few persons are stolid enough to submit to without seeking competent aid for its removal. In a few cases, however, the inflammation subsides, the foreign body becoming surrounded with fibrous tissue that tolerates its presence, and in rare cases it is possible for a foreign body to remain in the cornea a long time without provoking any reaction. Three cases were referred to in which foreign bodies were thus retained for periods varying from one to eighteen months.

Of the removal of foreign bodies from the cornea in general, little need be said. The introduction of cocaine as a local anesthetic has enormously simplified this. There is, perhaps, some danger now of being led by the passive demeanor of the patient to indulge in unnecessary manipulation of the parts. The thorough cleansing of the actual cavity of lodgment, together with the scraping away of the bruised and lacerated tissue, is very important, but the promiscuous scraping of the neighboring surface, in the attempt to catch a foreign body that is not clearly seen, is always harmful, if not dangerous.

When the foreign body enters with such force as almost to penetrate the cornea, and to a still greater extent when it projects into the anterior chamber, its

removal becomes an operation of considerable delicacy and importance, on account of the danger of the premature escape of the aqueous humor and the scratching or puncture of the anterior capsule of the lens, causing traumatic cataract.

COLLEGE OF PHYSICIANS.

Regular Meeting, October 5, 1892.

THE VICE-PRESIDENT, DR. J. M. DA COSTA,
IN THE CHAIR.

DR. C. W. DULLES read a "Report of a Case of Akromegaly." (See p. 515.)

DR. S. SOLIS-COHEN also reported "A Case of Akromegaly." (See p. 518.)

DR. F. A. PACKARD remarked that the peculiar limitations of the fields of vision in Dr. Dulles's patient go to prove that there is a large number of cases of akromegaly in which a tumor of the pituitary body, on which so much stress has been laid, has nothing to do with the disease. An interesting observation has been made by a German experimenter. He has found that excision of the thyroid gland causes in rabbits increase in the size of the pituitary body. In the case that Dr. Packard had presented to the College the thyroid gland was absolutely imperceptible to touch. It had been a matter of consideration, if the final results of English experiments in transplantation of a thyroid gland to the peritoneal cavity, in cases of myxedema, prove favorable, of persuading the patient to submit to the operation in the hope of obtaining relief from the intense headache from which he suffered.

DR. F. X. DERCUM stated that in neither of the cases that he had reported was there headache, and in only about one-third of the reported cases had headache been noted. It appears that only those cases come under observation in which there is headache or eye-trouble, and that many cases exist in which the individuals have no occasion to consult a physician.

In connection with the pituitary body, it is noteworthy that, some years ago, Dr. Mitchell reported a case of cerebral aneurism which probably had its origin in an anomalous vessel of the circle of Willis. The whole pituitary body had been destroyed by the aneurism, and there had been bi-temporal hemianopsia, but there was no trace of any peculiar enlargement of the face, hands, or feet.

Dr. Cohen's case is also of interest, as showing that the affection consists not only in an enlargement of the ends of the body, but in an overgrowth of the muscular tissue and of the bony walls of the chest. While there is a tendency for the accentuation of the enlargement in the ends of the body, it is not limited to these parts, but may appear elsewhere.

The observation in regard to the hemianopsia is of exceeding interest, and brings up the whole question whether the bi-temporal hemianopsia found in other cases is to be regarded as due to the enlargement of the pituitary body or not.

DR. C. W. DULLES said that in studying a rare disease there is always a little risk of making the mistake of considering as an example of the disease cases that are really not such. There is some danger that cases

of mere gigantic development may be considered as cases of akromegaly. According to Marie, this disease does not consist simply in a mere overgrowth of certain tissues, but it is a disordered condition of the system, of which overgrowth of certain tissues is only one of the manifestations. Genuine cases of akromegaly have something more than this, and cases thought to be such ought (if medical terms are to have any fixed meaning) to present a resemblance in their clinical history to the picture drawn by Marie, who first described the disease. Dr. Dulles contended that the history given by Dr. Cohen and the pictures presented did not impress him with the idea that the patient had akromegaly. In order to justify that diagnosis, it should be possible to contrast the present condition, either by good description or by pictures, with something quite different within a recent period. The man is naturally large, has been a blacksmith, and is well developed as an athlete. The fact that he has a large head, legs, and hands, and a curved back, does not justify the belief that he has what Marie called akromegaly.

The photographs shown by Dr. Cohen seem to represent a man who is pretty uniformly well-developed, and who has, what Marie says does not occur in akromegaly, an unusual development of the long bones. The hands look graceful and well proportioned. They do not appear to be the sausage-shaped fingers of Marie. There seems to be nothing peculiar about the pictures except that they show a very large and muscular man, with unusually long arms.

DR. S. S. COHEN replied that he had studied the case carefully from the standpoint of akromegaly. The photographs do not show the appearance so well as does the man himself, but those familiar with the disease will recognize that the physiognomy and the hands are the same as those in the cases presented by Dr. Dercum. The tracings and photographs of these hands are not normal, nor are they graceful. The deep furrows, the cylindrical shape and the thick, fleshy pads of the fingers, and the lateral enlargement of the whole hand are marked, and had attracted the attention of the man's fellow-students. They had especially remarked that the wrists were not proportionately enlarged. Further, the face is striking, and the man himself reports a change in his features and an increase in the size of his hat. His ears, which were disproportionately large as a boy, are now not so much out of place. The projection of the skull over the frontal sinuses and that of the malar bones are marked; the lips are thickened, the lower lip overhangs, and the vertical depth of the jaw is increased. The curved back, the prominent abdomen and the varicosities, while not in themselves remarkable, added much to the *tout ensemble* which justified the diagnosis. If to these facts is added the further fact that, although large, the man is not, in any proper use of the words, well developed, but that, as stated in the first place, he is awkward and clumsy, and although, when a blacksmith, he could handle a heavy hammer with ease, yet now, when he is apparently so much more muscular, he has little strength, there can be no doubt that this is a genuine case of akromegaly. In addition, there is apparent atrophy of the thyroid gland.

DR. F. X. DERCUM stated further, that from the photographs and the history, he had no doubt that the case

reported by Dr. Cohen was one of akromegaly. The face has the vertical elongation, the vertical depth of chin, the increase of the malar prominences, and also the thickening of the superciliary ridges. The hands are almost typical. The man is still young, and in the course of a few years the case will probably become more pronounced. In the case reported by Virchow, which has never been disputed, the nose and mouth were not excessively enlarged, but the hands were large, and so also were the muscles.

Psychic depression is not a necessary feature of the affection. It was present in one of Dr. Dercum's cases for a short time, and not present in the other. Neither of these cases had occasion to consult a physician. Neither had headache or eye-changes.

CORRESPONDENCE.

SURGERY OF THE APPENDIX VERMIFORMIS.

To the Editor of THE MEDICAL NEWS,

SIR: I have just read with interest a leading article in THE MEDICAL NEWS for August 6th on the matter of operative treatment in inflammation of the vermiform appendix.

The fact that I live in a remote island, and, further, that a holiday of two months has taken me away from the haunts of books, must explain this tardy allusion to that paper.

The article discusses the origin of the operation for removing the vermiform appendix, and it is stated that to Dr. Thomas G. Morton belongs the credit of devising this procedure; the suggestion is made that the operation should be called "Morton's operation," and it is asserted that Morton's operation embodies one of the most important and radical advances of modern surgery. Dr. Morton thus becomes the founder of what will, I suppose, be known in the future as "Appendiceal Surgery"—should the present love for ridiculous terms survive.

I gather that Dr. Morton's first operation was performed in 1888, and was reported in the Philadelphia County Medical Society's *Transactions* for that year. The nature of the operation is not stated. Who first excised the appendix vermiformis some musty and forgotten tome will no doubt reveal in course of time. I know that the cecum was wholly removed (with success, by the by) by Arnaud, in 1732, but I have not yet completed my inquiries into the past surgical history of its appendage. So far as modern times are concerned, I should say that we owe the little item of surgical treatment under discussion to the admirable writings of Fitz, whose chief monograph appeared in 1886. In 1886 a patient with relapsing typhilitis came under my care in the London Hospital, and after due consideration I proposed to "deliberately seek for and remove" his appendix. I operated upon him during a period of apparently perfect health, on February 16, 1887, and was able to correct the distortion of the appendix without actually excising it. He made a perfect recovery. On September 19, 1887, I brought the matter before the Royal Medical and Chirurgical Society. The paper was read in February, 1888. I advised the treatment of selected cases of relapsing typhilitis by the deliberate

removal of the offending appendix during a quiescent period. The proposal was not well received. In due course, however, an exuberant reaction took place, and of late years appendices have been removed with a needless and illogical recklessness which has brought this little branch of surgery into well-merited disrepute.

Discussions on questions of priority constitute the most pitiable and petty items in the literature of medicine. Time disposes of all such questions with absolute justice. The object of this letter is merely to bring up from oblivion an unpretending paper which lies buried in the annals of an ancient society.

Believe me to remain,

Yours faithfully,

FREDERICK TREVES.

6 WIMPOLE ST., CAVENDISH SQUARE, W.,
LONDON, October 19, 1892.

NEWS ITEMS.

The New York State Medical Association will hold its ninth annual meeting at the Mott Memorial Hall, New York, November 15, 16, and 17, 1892.

The following papers are announced:

"Pneumectomy for relief of tubercular abscess of the lung; twice on the same patient; recovery." By J. Blake White, M.D., of New York Co.

"Traumatic osteo-arthritis lesions which involve the proximal segment of the ankle-joint." By Thomas H. Manley, M.D., of New York Co.

"Muscular traction for hip-joint disease." By T. M. Ludlow Chrystie, M.D., of New York Co.

"Ectopic pregnancy." By Henry D. Ingraham, M.D., of Erie Co.

"Treatment often found necessary after trachelorrhaphy for the purpose of restoring the uterus to its normal condition." By William H. Robb, M.D., of Montgomery Co.

"The palliative treatment of such cases of cancer of the uterus and its adnexa as are not amenable to radical operative measures." By J. E. Janvrin, M.D., of New York Co.

"Antiseptic vaginal and intra-uterine injections unnecessary, if not injurious, in the daily practice of midwifery." By Darwin Colvin, M.D., of Wayne Co.

"The question of drainage in pelvic and abdominal surgery." By C. C. Frederick, M.D., of Erie Co.

"A case of puerperal eclampsia at the seventh month, with a few thoughts as to treatment from practical experience." By Douglas Ayres, M.D., of Montgomery Co.

"The etiological factors of a general character, potent in the production of diseases peculiar to women." By George Tucker Harrison, M.D., of New York Co.

"Abortion and manslaughter." By F. W. Higgins, M.D., of Cortland Co.

"Pelvic version." By T. J. McGillicuddy, M.D., of New York Co.

"Abdominal hysterectomy for myoma." By Frederick A. Baldwin, M.D., of New York Co.

"Tumors of the orbit and adjacent cavities." By Charles Stedman Bull, M.D., of New York Co.

"Ecticism in the treatment of cataract." By Alvin A. Hubbell, M.D., of Erie Co.

"The treatment of neglected cases of rotary lateral curvature of the spine." By Reginald H. Sayre, M.D., of New York Co.

"A review of some of the injuries of the upper extremities." By E. M. Moore, M.D., of Monroe Co.

"The mental symptoms of fatigue." By Edward Cowles, M.D., of Summerville, Mass.

"Paraplegia." By Charles W. Brown, M.D., of Washington, D. C.

"Acute pleurisy." By Frank S. Parsons, M.D., of Northampton, Mass.

"The question of maternal impressions." By H. S. Williams, M.D., of New York Co.

"A clinico-pathological study of injuries of the head with special reference to lesions of the brain substance." By Charles Phelps, M.D., of New York Co.

"Personal experiences and conclusions in the domain of brain surgery." By Roswell Park, M.D., of Erie Co.

"A plea for the early extirpation of tumors." By John W. S. Gouley, M.D., of New York Co.

"Fractures of the neck of the femur in the aged." By Stephen Smith, M.D., of New York Co.

"Fractures of the patella treated by continuous extension; patients not confined to bed." By Joseph D. Bryant, M.D., of New York Co.

"Some recent cases of appendicitis." By Nathan Jacobson, M.D., of Onondaga Co.

"A report of some cases of compound depressed fracture of the skull." By George D. Kahlo, M.D., of Indiana.

"The achievements of American surgery." By Frederic S. Dennis, M.D., of New York Co.

"A few facts and fancies." *a.* Early aspiration in pleurisy. *b.* Mineral waters, crude and refined. *c.* Coughing made easy in bronchiectasis. *d.* Craftiness of the insurance sponge. By Henry D. Didama, M.D., of Onondaga Co.

"The etiology of gastric ulcer." By Charles G. Stockton, M.D., of Erie Co.

"The examination and commitment of the insane in New York County." By Matthew D. Field, M.D., of New York Co.

"Mitral stenosis in pregnancy, with report of cases." By Zera J. Lusk, M.D., of Wyoming Co.

"The use of electricity in midwifery." By Ogden C. Ludlow, M.D., of New York Co.

"A résumé of our present knowledge of microbes in disease." By Nelson B. Sizer, M.D., of Kings Co.

"Winter cholera in Poughkeepsie." By James G. Porteous, M.D., of Dutchess Co.

"Discussion on the prophylaxis and treatment of cholera." By Alfred L. Carroll, M.D., of New York Co. By Joseph D. Bryant, M.D., of New York Co.

"Suggestions relating to improvement of the quarantine system." By Stephen Smith, M.D., of New York Co.

"The limit of responsibility in the insane." By John Shady, M.D., of New York Co.

"Some personal observations upon the treatment of alcoholism, and the known effects of alcoholic abuse upon posterity." By H. Ernest Schmid, M.D., of Westchester Co.

"Climatology in its relation to disease." By S. J. Murray, M.D., of New York Co.

"The therapeutics of pyrexia." By S. T. Armstrong, M.D., of New York Co.

"Brief comments on materia medica, pharmacy, and therapeutics." By Edward H. Squibb, M.D., of Kings Co.

"Dermic and hypodermic therapeutics." By S. F. Rogers, M.D., of Rensselaer Co.

"Some recent experience in renal surgery." By E. D. Ferguson, M.D., of Rensselaer Co.

Fifth International Congress of Otolology.—Baron Léon von Lenval, of Nice, has offered a prize of 3000 francs (\$600) for the best instrument for improving the hearing power of those partially deaf. It is to be constructed on the principle of the microphone, and to be convenient to carry. Instruments in competition for the prize should be sent to Professor Politzer, president of the jury, in Vienna, before the 31st day of December, 1892.

Only finished instruments will be admitted in competition. They must be complete in mechanical construction.

The publication of the decision of the jury, and the giving of the prize, will take place at the Fifth International Congress of Otolology, in September, 1893.

Billroth has just celebrated the twenty-fifth anniversary of his accession to the professorship of surgery at Vienna, and the fortieth anniversary of his entrance upon the practice of medicine. In recognition of his valuable services the Emperor of Austria has conferred a special honor upon Billroth.

In re Cholera.—The following letter of advice was received by an officer of a Board of Health, and may prove of interest to the medical profession:

*The Census and Board of Health,
Washington.*

DEAR SIR:

As so I have was a strong cholera doctor in old land, Sweden, I will therefore hereby send the Board of Health few lineer.

I will first say: that no body who dead in cholea, may be burned, and bed or cloths after this is no in right way, for this is more to spred and stop dean choleraan. To all who comes near this smocking been in same time get cholerabacile, the nerv- and bloodsysteme, where after choleraan can beck out in a half and one year thereafter.—Every body, who dead in choleaan, may be burial in 8 to 10 feet deep grave with the cloths and sheets, who they dead in withing 10 hour after dead; no more. The grave may be overlayd with kalk and on coalashes. The rooms, beds and cloths after cholera dead must be wel clearned or washed with frish water, saltsoap and spiritus of comphor, or the cloths who not can suffer a wash, may be strippled with sp. camphor. Thereafter rooms and all the cloths may be smocked by one part camphor, one part of sulphur, $\frac{1}{2}$ part of colophonium and litle tar, thereafter hang all cloths up in a free air room for 6 weeks, wherafter the cloths is no fare in.

I tink this may be publiced, so all the Boad of Healt in all sea town may knowled it.

Respectfully,

P.S. 200 children have of me been this year vaccinated, 18 thereof missed. L.